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**CANADA**  
**DEPARTMENT OF NORTHERN AFFAIRS**  
**AND NATIONAL RESOURCES**

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**National Museum of Canada**  
**Bulletin No. 147**

**ANNUAL REPORT OF THE**  
**NATIONAL MUSEUM OF CANADA**  
**FOR THE FISCAL YEAR 1955-56**

**1957**

*Price: \$1.50*



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DEPARTMENT OF NORTHERN AFFAIRS AND  
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NATIONAL MUSEUM OF CANADA

ANNUAL REPORT OF THE  
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Issued under the authority of  
The Honourable Alvin Hamilton  
Minister of Northern Affairs and National Resources  
Ottawa  
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## GENERAL ACTIVITIES OF THE NATIONAL MUSEUM OF CANADA

*By F. J. Alcock, Chief Curator*

Thirteen full-time officers and four part-time workers collected vertebrate palæontological specimens in Alberta and Saskatchewan and made studies of birds in southern Quebec, of mammals in Newfoundland-Labrador, of intertidal and estuarine invertebrates in British Columbia, and general biological studies at Eureka on Ellesmere Island, Northwest Territories. Botanical studies were carried out in New Brunswick, Quebec, and Alberta. Archæological sites of aboriginal man were investigated in the Yukon, Northwest Territories, Ontario, and New Brunswick, and ethnological studies were made in Nova Scotia, Quebec, New Brunswick, and the Northwest Territories.

The following National Museum bulletins were issued: *Indians of Canada*, by Diamond Jenness, Bulletin No. 65, 3rd edition, 452 pages, 1 map, 7 coloured plates, and 120 other illustrations; *The Vascular Plants of the Western Canadian Arctic Archipelago*, by A. E. Porsild, National Museum of Canada, Bulletin No. 135. Biological Series No. 45, 226 pages, 24 plates, 22 figures; *Ecological Control of the Occurrence of Barnacles in the Miramichi Estuary*, by E. L. Bousfield, Bulletin No. 137, 69 pages, 11 figures; *Annual Report of the National Museum of Canada for the Fiscal Year 1953-54*, Bulletin No. 136, 122 pages. In addition, a new set of Bird Cards in colour, 50 in a set, was issued. Besides the above, 35 papers and reviews were published in outside journals, and 43 public lectures and addresses were given by members of the technical staff.

The Sir Alfred Bossom collection of 1,600 items of native West Coast art was received from England. The National Museum's collection of such material is the largest to be found at any one place in the world.

From early November to April, two series of illustrated lectures for adults and children were presented in the Museum auditorium. Five thousand attended the adult lectures and ten thousand the children's series. A one-hour motion picture program called "Canada in Colour" was given Monday to Friday during July and August.

The Macoun Field Club, consisting of three groups—Senior or High school, Intermediate, and Junior—completed its seventh year of activity. The Club is sponsored jointly by the Ottawa Field-Naturalists' Club and the National Museum.

Changes in staff included Miss Joan Trew Kembar, anthropologist, separation in April. She was succeeded on November 15 by Miss Katherine Helen Capes. Mr. Stuart D. MacDonald, technician in the Zoological Section, left in February to proceed with university studies in zoology.

A. E. Porsild, Chief Botanist in charge of the National Herbarium, was granted the degree of Doctor of Philosophy from the University of Copenhagen in June.

During the year the National Museum sent a large collection of native Indian cultural material to the Art Galleries of London and Hamilton for month-long exhibitions. The Museum took charge of arranging for the tour through Canada of a special UNESCO exhibition of Australian Aboriginal cultural material.

The Chief Curator opened the exhibition of Indian material at London with a talk on the National Museum. He also spoke before the Ottawa Valley Historical Society at Pembroke on April 25 and the Canadian Association for Adult Education in Ottawa on May 4. On January 4 he addressed the Ottawa Branch of the Canadian Institute of Surveying and Photogrammetry on "Early Exploration in the Canadian Northwest". He prepared an article entitled "Showcase for the Nation" for the March number of *Food for Thought*.

## EDUCATIONAL WORK

One of the primary aims of the National Museum of Canada is to try to acquaint the public with the wealth of information accumulated by members of this institution through a century of research. At the same time, the museum seeks to provide information on current investigations in the field of the natural sciences. To help meet these objectives it uses the media of exhibits, lectures, publications, photographs, film strips, and correspondence, and of visual aids such as motion pictures, specimens of birds and mammals, and Indian and Eskimo materials sent out on loan.

### National Museum Lectures

### *Adult Lectures in English*

During the autumn and winter months the National Museum presented the following series of lectures:

- Trees of Canada*, by D. A. Macdonald, B.Sc., L.L.D., Ottawa.
- Mankind around the World*, by T. F. McIlwraith, M.A. (Cantab.) F.R.S.C., Toronto.
- Life on a Coral Reef*, by John F. Storr, M.A., Ph.D., Miami, Florida.
- From the Pyrenees to Paris*, by Neil Douglas, Meriden, Conn.
- The White Continent*, by E. F. Roots, Ph.D., Ottawa.
- The Living Desert*, a motion picture by Walt Disney.
- Botanical Mysteries*, by Hugh M. Raup, A.M., Ph.D., Cambridge, Mass.
- African Excursion*, by Kenneth E. Eade, Ph.D., Ottawa.
- Power from the St. Lawrence*, by C. G. W. MacIntosh, Cornwall.
- Life within the Honeybee Colony*, by C. A. Jamieson, B.Sc., Ph.D., Ottawa.
- Early Man in Ontario*, by Thomas E. Lee, M.A., Ottawa.
- Helicopters over the Arctic*, by Y. O. Fortier, M.Sc., Ph.D., Ottawa.
- Domes against the Sky*, by Peter M. Millman, A.M., Ph.D., Ottawa.
- The Ancient World: Egypt*, a motion picture by Ray Garner.
- The Canadian Wildlife Service*, by Victor E. F. Solman, M.A., Ph.D., Ottawa.
- Peaceful Applications of Atomic Energy*, by Clyde Kennedy, B.Sc., Chalk River.
- Wildflowers along New England Trails*, by Raymond D. Wood, M.A., J.D., A.R.P.S., Mount Kisco, N.Y.

### *Adult Lectures in French*

*Regards Sur L'Afrique noire*, by Eugène Bussière, Ottawa.

*La Cambodge et nos amis les Cambodigens*, by Alexandre J. Boudreau, Ottawa.

### *Children's Lectures*

*Bear Country*, a motion picture by Walt Disney.

*Snakes and What They Eat*, by J. S. Bleakney, National Museum.

*All the King's Horses*, a film program.

*Hunting with a Camera*, by S. D. MacDonald, National Museum.

*All about Australia*, a film program.

*Seal Island*, a motion picture by Walt Disney.

*Children of Other Lands*, by the Citizen's Committee on Children, Ottawa.

*Nanook of the North*, a film on Eskimo Life.

*The Great Adventure*, a nature film.

*Hunting for Minerals*, by S. C. Robinson, Ph.D., Ottawa.

*All about Dinosaurs*, by W. Langston, Ph.D., National Museum.

*Life within the Honeybee Colony*, by C. A. Jamieson, Ph.D., Ottawa.

*From the Canoe to the Airplane*, by F. J. Alcock, Ph.D., Chief Curator, National Museum.

*A Journey to the Antarctic*, by E. F. Roots, Ph.D., Ottawa.

*All about New Zealand*, a film program.

*Animals of Canada's Arctic*, by Victor E. F. Solman, Ph.D., Ottawa.

*Canada's Natural Zoo*, by L. E. Pelton, B.Sc.F., Ottawa.

*Sheep Dog, Police Dog*, a film program.

*Salute to the Boy Scouts*, a film program.

### *Special Programs*

The National Museum also presented the following special programs:

*The Expanding Universe*, by Sir Harold Spencer Jones, Astronomer Royal, London, England.

*Canadian Film Awards—1954*, by the Canadian Film Institute, Ottawa.

*Peruvian Films*, by the Peruvian Embassy, Ottawa.

*Folk Songs of Peru*, by Osear H. Alcazar, Lima, Peru.

*English Folk Songs in the Old and New Worlds*, by Maud Karpeles, London, England.

*The Great Adventure*, a prize-winning Swedish film.

*Canada in Colour*, a series of films in colour on the Canadian scene presented to Museum visitors during July and August, from 3.00 to 4.00 p.m.

*Folksongs of Canada*, a half-hour lecture with music preceding the program, Canada in Colour.

### **Group Visits**

The National Museum provided guided tours of the exhibit halls for over four thousand students and other groups of visitors from Ottawa and towns and cities in Ontario, Quebec, New York State, England, and Pakistan. The groups represented such organizations as the Colborne Women's Institute, the Jewish Community Centre Summer Day Camp, the Y.M.C.A. Day Camp, the Jeunesse Musicale, the Grafton Women's Institute, the Canadian Guards Regiment, the 4H Club of Ontario, the R.C.M.P. Staff College, and the Rotary Club's "Adventure in Citizenship" with its senior high-school students from across Canada.



## Lecture Hall

One hundred and fifty-two programs were held in the Museum by such organizations as the National Gallery of Canada, the Science Film Group of Ottawa, the Geological Survey, the American Society of Tool Engineers, the Royal Astronomical Society, the Canadian Diabetic Association, the Ottawa Fish and Game Association, the Continental Club of Ottawa, the Colour Photography Association of Canada, the Canadian Geographical Society, the Community Planning Association of Ottawa, the United Nations Association, and various diplomatic groups.

## Photographs

Prints of photographs on anthropological, biological, and palæontological subjects were sold at a nominal sum to teachers, students, scientists, and publishers, in Canada, the United States, England, Holland, and Germany.

## Visual Aids

Films, lantern slides, mounted photographs, dioramas, mounted specimens of birds and mammals, and specimens of Indian and Eskimo materials were loaned to Canadian teachers on payment of transportation charges one way.

## Publications

Results of scientific investigations carried on by members of the staff appear in the Museum's bulletins, memoirs, leaflets, special contributions, and miscellaneous series, which are supplied to institutions and individuals in all parts of the world. Some of the less technical publications are particularly suitable for educational purposes. A selected list is sent to teachers, pupils, and others upon request. A nominal charge is made for all Museum publications.

# ARCHÆOLOGY

## Field Work

R. S. MacNeish headed a field party of eleven people to the Firth River, Yukon Territory. The party began excavations in early July and continued until mid-September. The site was an extremely important one containing a sequence of nine cultural complexes, the last three Eskimo. Many of the remains should have considerable bearing on the problem of immigration and diffusion from Asia into the New World. Some of the earlier cultural complexes appeared to have considerable antiquity, and some of those in the middle periods contained pottery that may provide a link between the Eastern Woodlands culture and that of northeastern Asia.

T. E. Lee, with a crew of fifteen, resumed field work around Sheguian-dah on Manitoulin Island for two months. Seventeen new trenches were opened, 636 square feet were excavated, and 100 square feet of old trenches were reopened. He spent the remainder of the season unassisted in brief survey operations in the Parry Sound and Muskoka districts and in checking previously discovered sites in the Aylmer-London-Mt. Bridges region.

W. E. Taylor accompanied H. B. Collins of Washington, D.C. and G. Wright and Norman Emerson of Toronto on a joint expedition to Southampton Island for the Smithsonian Institution of Washington, D.C., and the National Museum of Canada. From early in July until September, excavations were primarily concerned with the enigmatic Dorset culture of the Eastern Arctic. They uncovered an extremely large sample of Dorset archæological culture, which will contribute to the ultimate understanding of the prehistory of the Eastern Arctic.

J. A. Zaborski began an archæological survey of New Brunswick by examining materials from more than four hundred potential archæological sites.

### Office Work

R. S. MacNeish prepared the following articles for the Annual Report of the National Museum of Canada: "A Summary of the Archæological Investigations in Southeastern Manitoba" and "Archæological Reconnaissance of the Delta of the Mackenzie River and Yukon Coast"; "Prehistoric Settlement Patterns in the Northeastern Peripheries of Meso-America" for Gordon R. Willey of Harvard University. Mr. Willey is editing a volume entitled "*New World Settlement Patterns*", which will be published in the Viking Fund Series. Dr. MacNeish made an analysis of the archæological materials from the Firth River site and prepared an article for the University of Alaska Anthropological Series entitled "The Engigsteiak Site on the Yukon Arctic Coast". He also prepared manuscripts entitled "An Introduction to the Archæology of Southeastern Manitoba"; "Preliminary Excavations in the Sierra de Tamaulipas", and in conjunction with P. C. Mangelsdorf and W. C. Galinat of Harvard University, "Archæological Evidence on the Diffusion and Evolution of Maize in Northeastern Mexico"; and another one in conjunction with T. A. Whitaker of the United States Department of Agriculture and Hugh C. Cutler of the Missouri Botanical Gardens, "An Analysis of the Cucurbit Materials Excavated from Two Caves near Ocampo, Tamaulipas, Mexico". "Archæological Discoveries on the Firth River" was the title of a popular article prepared for the Hudson's Bay Company magazine "The Beaver".

T. E. Lee continued research studies on problems connected with the Sheguiandah site.

Miss Joan Kembar catalogued material from the Belcher Islands and from British Columbia.

Miss Katherine Capes catalogued materials from the Yukon, assisted in the analysis of bone from archæological sites, catalogued materials that had been submitted to the Museum by various non-staff members, and began an analysis of some unpublished archæological materials from Manitoba.

### Publications

*Ancient Maize in Mexico*, by R. S. MacNeish, *Archæology*, Vol. 8, No. 2. 1955.

*Two Archæological Sites on Great Bear Lake, Northwest Territories, Canada*, by R. S. MacNeish. Annual Report of the National Museum of Canada for the Fiscal Year 1953-54, Bulletin No. 136. 1956.

*The Development of Agriculture and Concomitant Development of Civilization in Meso America*, by R. S. MacNeish. American Philosophical Society Year Book, 1955. 90936—2

*Archæological Evidence of the Diffusion and Evolution of Maize in Northeastern Mexico*, by R. S. MacNeish, Paul C. Mangelsdorf, and Walton C. Galinat. Botanical Museum Leaflets, Harvard University, vol. 17, No. 5. 1956.

*The Archaic Problem, as seen from Ontario*, by T. E. Lee. Mimeographed.

*The Second Sheguiandah Expedition, Manitoulin Island, Ontario*, by T. E. Lee, *American Antiquity*, Vol. 21, No. 1, July, pp. 63-71. 5 plates.

## Lectures

*Recent Finds in Canada*, by R. S. MacNeish, Anthropological Club, University of Michigan, October 1955.

*Micro-blade Sites in the Canadian Northwest*, by R. S. MacNeish. Anthropological Advanced Archæological Class, University of Pennsylvania, October 1955.

*Eskimo Art*, by R. S. MacNeish, *et al.*, on Exploring Minds television program, Ottawa, December 1955.

*Correlation of Meso-American Sequences*, by R. S. MacNeish, discussor, American Anthropological Association, Boston, Massachusetts, November 1955.

*A Recent Canadian Archæological Discovery*, by R. S. MacNeish. News Roundup, CBC., Ottawa, March 1956.

*Archæological Discoveries on the Firth River*, by R. S. MacNeish. Y.M.C.A. Luncheon Club, Ottawa, March 1956.

*The Geological Problems of the Sheguiandah Site*, by T. E. Lee, Manitowaning, Ontario, September 12, 1955.

*The Sheguiandah Site*, by T. E. Lee. Royal Ontario Museum, October 22, 1955.

*The Geological and Archæological Problems of the Sheguiandah Site*, by T. E. Lee, Globe, Arizona, December 14, 1955.

*Most Ancient Man in America as Revealed by Excavations on Manitoulin Island, Ont.* by T. E. Lee, Detroit Institute of Arts, Jan. 11, also Wayne University Auditorium, Detroit, January 12.

*Early Man in Ontario*, by T. E. Lee, Deep River, Ontario, March 8; also March 9, 1956. Ottawa Valley Historical Society.

## ETHNOLOGY

### Field Work

Marcel Rioux engaged in the study of the contemporary socio-cultural evolution of the Acadians of New Brunswick to compare it with certain results obtained in the study of parts of rural Quebec. The study of St. Joseph Memramcook and Cape Bald, two villages close to Moncton, was begun. A linguistic survey was made in these two villages and in Shediac with the help of Professor Gaston Dulong of Laval University.

Help was given to the organization of the Acadian Bicentennial in collecting and preparing folklore materials for the celebration of this anniversary.

The establishment of an Acadian Centre for Research in Folklore and Linguistics was discussed with representatives of St. Joseph University, Moncton, N.B.

June Helm MacNeish collected linguistic materials and music at and near Fort Simpson, N.W.T., during June. In the linguistic recordings the emphasis was on the vocabulary and phonetics of the Slave tongue, a branch of the Athapaskan language family. The music took the form of unaccompanied songs and wordless chants with drum accompaniment, both by single performers and drum dance music played by three drummer-chanters.



Gilles-R. Lefebvre accompanied Claude-Dumont Desgoffe to Belcher Islands, N.W.T., for an ethnographic survey of that region. During August, Desgoffe and two Eskimos were drowned while travelling by canoe from Omarolluk in the Belcher Islands. G.-R. Lefebvre studied the principal sub-dialects east of the Hudson Bay and prepared a glossary comprising 2,000 words, sentences, and expressions.

In Nova Scotia Helen Creighton collected songs, bagpipe music, dancing tunes played on fiddle and mouth-organ, games, and tall stories.

The study of French-Canadian folklore was continued by Luc Lacourcière, Abbé F. X. Savard, and Madeleine Doyon of Les Archives de Folklore, Laval University, Quebec. Many tape recordings were made of songs, tales, and various other items.

Carmen Roy continued her ethnographic study of Gaspé Peninsula. Most of her field season was devoted to the comparative study of the fishing techniques and vocabularies of the different villages of Gaspé. She spent three weeks in the region of Moncton, N.B., as an adviser on the Acadian folklore which was used as a theme in the Bicentennial Celebrations. Miss Roy also acted as an adviser to the National Film Board which is planning to make a film on the folklore of Gaspé.

## Office Work

Marcel Rioux analysed the materials collected and co-operated with the Research Center for Amerindian Anthropology in the launching and editing of two issues of *Anthropologica*. He organized a Canadian section of the International Ethnographic Film Committee, delivered a series of lectures to the University of Ottawa on anthropology, and attended the meeting of the CBC held at Ste. Adele under the auspices of the Canadian Institute of Public Affairs, acting as Chairman on September 22.

Asen Balikei completed the classification and catalogue of the folklore materials of the National Museum and helped in the preparation of folklore recordings for the general public. He was on loan to the Department of Citizenship and Immigration to make a study of the integration of Bulgaro-Macedonian immigrants of Toronto.

Helen Creighton and Carmen Roy analysed the materials collected in the field. Miss Creighton addressed the Canadian Authors' Convention in Kingston and the American Folklore Society in Washington, D.C.

## Publications

### RIOUX MARCEL:

*Notes autobiographiques d'un Iroquois Cayuga*, *Anthropologica*, 1: 18-37.

*Remarques sur les concepts de schème de modèles culturels*, *Anthropologica*, 2: 93-107.

*The Canadian Indian in Transition, Food for Thought*, February 1956, pp. 195-197.

### BALIKCI, ASEN:

*Remarques sur l'étude des valeurs en anthropologie culturelle*, *Anthropologica*, 1: 84-103.

*Note sur le Midewiwin*, *Anthropologica*, 2: 165-218.

## Lectures

### RIoux MARCEL:

CBC talks on "Iroquois, Ojibwa and Têtes de Boule", on November 4, 11, and 25, 1955.

CBC panel participant on "Indian Food", "Indian Handicraft", and "Indian Medicine", on September 16, 23, and 30, 1955.

"Relativisme culturel et jugements de valeurs", ACFAS, Ottawa, November, 1955.

A series of lectures on Cultural Anthropology given at Ottawa University from October to March 1955.

### BALIKCI, ASEN:

"Les peuples primitifs et le contact culturel", Protestant Forum, April 1955.

"Remarques sur la structure de groupe ethnique bulgare et macédonien à Toronto", ACFAS, Ottawa, November, 1955.

"The National Museum of Canada", Institut canadien-français, March, 1956.

## ZOOLOGY

### Field Work

L. S. Russell, accompanied by Wann Langston, Jr., made a survey of important localities for fossil vertebrates in Saskatchewan and Alberta. The Pleistocene of the Qu'Appelle Valley, the Paleocene of Big Muddy Valley, and the badlands of the Oldman formation near Steeveville were prospected. Two new rich localities for Miocene mammals in the Wood Mountain gravel were discovered near Rock Glen. The Eocene locality near Swift Current, the Oligocene near Lac Pelletier, and fossil localities in the Cretaceous Milk River formation near Writing-on-Stone were visited. At Eastend the Cretaceous Frenchman formation was examined, and some collecting was done in the Oligocene Cypress Hills formation and in the Cretaceous Oldman and Bearpaw formation near Comrey, Alberta. The camp of Lindblad near Munson Ferry was visited, and the Edmonton formation there was examined. Specimens in the University of Alberta were viewed. Paleocene mammal fossils were collected at Cochrane and Calgary, and fossil turtles near Aldersyde. A large dinosaur skull and other bones were discovered and collected at Scabby Butte, northwest of Lethbridge. A reconnaissance trip was made through the Crowsnest Pass. On the return trip to Ottawa, a stop was made at Harlowton, Montana, to examine fossil localities in the Cretaceous and Paleocene. During the Christmas holidays, Dr. Langston collected Permian vertebrates in Oklahoma.

W. Earl Godfrey, assisted by R. J. d'Entremont, carried on work in the Percé region, the Rivière du Loup region, and at Quebec City. Data were gathered on the species composition of the bird fauna, local distribution, numbers, habitat preferences, and behaviour. The 502 birds collected and prepared as study specimens included a series of nine Eastern Dowitchers, the best series in breeding plumage in existence, which will elucidate certain puzzling aspects of the taxonomy of this species.

Austin W. Cameron, assisted by W. John Smith, studied the mammals of coastal Newfoundland-Labrador, with special emphasis on the caribou of the region. This part of Canada had been poorly represented previously in the National Museum collection and is, in fact, not well represented in any museum. Time was spent at Blanc Sablon, St. Anthony, Cartwright, Goose

Bay, and Nain, with side trips to Black Islands, Voisie's Bay, and Northwest River. Although no caribou were actually seen (as they are in the interior during the summer), valuable information was obtained from native hunters, game wardens, and other local residents. Arrangements were made for the purchase of caribou skulls collected during the autumn. Data were also obtained on the fur-bearers of the region, including the beaver introduced from Newfoundland. A good collection of small mammals was obtained near Cartwright, where they had not suffered the "crash" that had occurred in most areas during the winter of 1954-55. A total of 125 specimens was collected, most of which represent the genus *Microtus*. This is the first adequate series of the Labrador subspecies obtained by any museum. After leaving Labrador some collecting was done in southeastern New Brunswick and the Gaspé peninsula.

E. L. Bousfield investigated the distribution and ecology of intertidal and estuarine invertebrate animals of southern British Columbia, especially Vancouver Island. Approximately 400 miles of coastline were covered, and 54 collecting stations, mostly marine, were established. Some 10,000 specimens, mainly crustaceans, were taken. Water temperatures, salinity, and other hydrographical data were taken at each station. E. L. Bousfield was assisted by Eric Mills.

Sherman Bleakney began his field work on the herpetology of the Montreal area. Later he concentrated on the occurrence of rare species of amphibians and reptiles in Nova Scotia and New Brunswick. In addition, inquiries were made in Maine, New Hampshire, and Vermont as to local species and their abundance, in an effort to obtain a general picture of distribution in Eastern Canada. Although only 110 specimens were taken, they nearly all represented species that are considered rare; in Nova Scotia the Blanding's Turtle was recorded for the first time. Later in the summer, herpetological collecting was done in Ontario.

G. E. Lindblad made a palæontological exploration of the Edmonton formation on Red Deer River north of Drumheller, Alberta. A number of specimens were discovered, including what appears to be a complete skeleton of a hadrosaurian dinosaur, but time did not permit collecting more than the skull; the remainder of the specimen will be excavated during the field season of 1956.

S. D. MacDonald carried out a biological survey in the vicinity of Eureka, Ellesmere Island. With headquarters at Eureka, a cache was established at East Wind Lake, 12 miles to the north. During the first part of the season, most of the work was on mammals and birds, and a large number of the latter were banded. Nest checks and observations on behaviour were made, and a number of specimens were collected, together with a representative set of plants. The Greenland Wheatear, a new bird for this region, was found nesting, and the Baird Sandpiper was added to the list. Later in the season collecting was extended to the marine invertebrates and endo-parasites. Extensive field trips were made—several to Axel Heiberg Island, which were productive. Mr. MacDonald had the volunteer assistance of D. F. Parmalee.

John L. Crosby made a trip to the southern prairies of Saskatchewan and Alberta to obtain paintings and photographs of animal habitats for use in illustrations and exhibits.



## Office Work

L. S. Russell completed a paper on Pleistocene horse occurrences for the Annual Report and a longer paper on the Cretaceous reptile *Champsosaurus* for a bulletin. Progress was made on a monograph on the Tertiary mammals of southern Saskatchewan. A short paper on the Tertiary molluscs of southeastern Wyoming was completed. A beginning was made on short papers on the Tertiary molluscan fauna of Princeton, British Columbia, and on Paleocene mammalian fossils from Alberta. Identifications were made of recent gastropods from southern British Columbia. Motion pictures and kodachrome slides taken during the field season were edited and labelled. Specimens were identified for, or information supplied to the following: Geological Survey of Canada; Anthropology Section, National Museum of Canada; Education Service, Northern Administration; Granby Zoological Gardens; *The Beaver* magazine; and John de la Montagne, Colorado School of Mines. Specimens of fossil fishes and mammals were identified and labelled for inclusion in the collection. Dr. Russell, in addition to the above, performed the duties of Secretary-Treasurer and acting Editor of the Canadian Museums Association, which included planning the 1955 annual meeting in Ottawa and the publication of the Association's Bulletin and News Letter.

W. Earl Godfrey continued preparations for the re-writing of *The Birds of Canada*. Papers were completed on the first North American Record of the Little Egret, and some distributional notes on Canadian birds. Reviews of ornithological literature were prepared, and a number of manuscripts on birds were edited for *The Canadian Field-Naturalist*, *The Canadian Geographical Journal*, and the Arctic Institute of North America. A film commentary on birds was edited for the National Film Board. Specimens were identified for, or information was supplied to the following: Canada Post Office Department; Science Service, Department of Agriculture; Royal Canadian Mounted Police; Prof. W. Rowan, Department of Zoology, University of Alberta; A. L. Wilk, Camrose, Alberta; Nova Scotia Museum of Science; U. S. National Museum; University of Connecticut; Cornell University; Carnegie Museum, Pittsburgh. Mr. Godfrey served on the National Research Council's Associate Committee on Wildlife Research and reviewed projects and attended the annual meeting in Ottawa. Reports of the Christmas bird census from various points across Canada were edited. He reviewed and commented on an *Official List of French Names of Canadian Birds* for the Canadian Wildlife Service, and directed cataloguing and accessioning of new bird specimens and their distribution in the collection. The texts of labels for the systematic bird exhibit were completely revised. The abstracting and plotting of distributional data on birds from the literature was continued. Mr. Godfrey attended the annual meeting of the American Ornithological Union, Boston, Massachusetts, in October.

Austin W. Cameron continued his broad regional study of the mammals of the Gulf of St. Lawrence region, and completed detailed reports on the mammals of Anticosti Island and Newfoundland. Similar studies on the mammals of Prince Edward Island and Cape Breton are continuing. A comparative statistical study of the crania of Newfoundland black bears indicated a distinct subspecific rank for these animals. A manuscript

entitled *Guide to the Eastern Canadian Mammals* was submitted for publication by the National Museum. Specimens were identified for, or information was supplied to the following: Anthropology Section, National Museum of Canada; Ian MacLaren, Fisheries Research Board of Canada; R. O. Stanfield, Royal Ontario Museum; Dr. Charles H. Buckner, Forest Biology Laboratory, University of Manitoba; Dr. E. O. Höhn, University of Alberta; Leo Jobin, Williams Lake, B.C.; Prof. Ian McT. Cowan, University of British Columbia; Prof. Dale J. Osborn, Department of Zoology, Boston University; Dr. D. P. Snyder, University of Massachusetts; Leslie A. Viereck, University of Colorado; Prof. Stephen Durrant, University of Utah; Prof. Wolf Herre, Kiel, Germany. Mr. Cameron prepared reviews of literature on mammalogy for various publications, and supervised the accessioning and cataloguing of mammal specimens.

E. L. Bousfield completed studies on the shore crustaceans of eastern Nova Scotia and Newfoundland for publication in the Annual Report. He continued his research on the amphipod genus *Gammarus* and on the freshwater amphipods of Canada. The crustaceans collected during the field seasons of 1954 and 1955 were identified. Editorial work was done on several papers on invertebrate zoology. The storage facilities for the liquid-preserved invertebrates were overhauled and the specimens rearranged. A number of entomological exhibits prepared by the Department of Agriculture were placed on display. The work of Dr. I. Lubinsky who was employed during the summer months to revise part of the mollusc collection was supervised. Specimens were identified for, or assistance was given to the following: Dr. T. N. Freeman, Dr. W. N. Keenan and Mr. P. Brueggeman, Department of Agriculture, Ottawa; S. I. Matthews, Ottawa; Mrs. Graham Cooch, Ottawa; Mrs. B. Turner, Ottawa; Dr. H. H. Nesbitt, Carleton College, Ottawa; Miss A. Dewar, Argenteuil Historical Society; Mr. W. Black, McGill University; Mr. P. Brunel, Grande-Riviere, Quebec; Ontario Department of Planning and Development; Prof. F. P. Ide, University of Toronto; Mr. J. L. Martin, Sault Ste. Marie; Saskatchewan Lake Survey; Dr. Josephine F. L. Carl, Victoria, B.C.; Dr. E. Berkeley, Nanaimo, B.C.; United States National Museum; Dr. R. S. Howard, University of Delaware; Mr. L. H. Hubrecht, Lexington, Kentucky; Dr. J. G. Mackin, Texas Agricultural and Mechanical College; Dr. J. L. Barnard, University of Southern California; Mr. G. Graw, Hollywood, California. Dr. Bousfield attended the annual meeting of the American Malacological Union, Pacific Branch, and the annual meetings of the Canadian Committee on Freshwater Fisheries and the Fisheries Research Board of Canada. He supervised the meetings and field excursions of the Macoun Field Club.

Wann Langston, Jr., completed a descriptive paper on the fossil turtle *Basilemys* for the Annual Report. Two other papers completed were on the sebecosuchian crocodiles and on the importance of bone beds. Work was continued on the description of an Upper Cretaceous hadrosaurian dinosaur from Alabama, under an arrangement with the Chicago Museum of Natural History. Specimens of fossil vertebrates obtained by field work, purchase, or donation were accessioned, catalogued, and placed in the collection. Stored specimens were examined and recorded, and repacked for continued storage. The work of the laboratory of vertebrate palæontology was generally supervised, especially the installation of the mounted skeleton

of *Champsosaurus* in the exhibition hall. Most of the specimens in storage at the laboratory were moved to new fireproof storage quarters. Bruce McCorquodale, of the Saskatchewan Museum of Natural History, spent a month in the laboratory and received instructions in preparation methods and casting techniques. A dermestid colony was set up for the cleaning of skeletons of modern animals. To obtain information needed in his work, Langston visited the American Museum of Natural History and the Chicago Natural History Museum. He attended the annual meeting of the Society of Vertebrate Paleontology at New Orleans and arranged exchange of specimens with Tulane University. He identified specimens for or supplied information to: Dr. E. T. Tozer, Geological Survey of Canada; the Saskatchewan Museum of Natural History; E. L. Simons, Department of Geology, Princeton University.

Sherman Bleakney completed papers on the herpetology of Nova Scotia and Ontario, and continued to assemble data for a study of the amphibians and reptiles of Eastern Canada. He prepared reviews of papers on herpetology, did editorial work on papers submitted to the *Canadian Field-Naturalist*, and prepared a script for a film strip on "Turtles and Lizards of Canada". He accessioned and catalogued specimens of amphibians and reptiles. The liquid-preserved herpetological collection was overhauled. An investigation was made of the latest types of containers and shelves for fluid-preserved collections; this included a visit to the Royal Ontario Museum. Specimens were identified for or information was supplied to F. H. Schultz, Canadian Wildlife Service; the Grolier Society of Canada; J. D. Cleghorn, Redpath Museum; C. D. Bird, University of Manitoba; and to Roger Conant, Philadelphia Zoological Society.

G. E. Lindblad completed the mounting of the skeleton of *Champsosaurus* and installed it in the exhibition hall. The skeleton of the horned dinosaur *Styracosaurus* was received from the Royal Ontario Museum. The skull of a specimen of *Edmontosaurus*, discovered during the 1955 field season, was prepared. Mr. Lindblad gave detailed supervision to the preparation of fossil vertebrates in the laboratory.

S. D. MacDonald was responsible for the operation of the zoological laboratory and he prepared specimens for study and exhibition. On his return from the field he began writing reports on his investigations at Isachsen and Eureka and sorted the large collection of kodachrome pictures taken by him in the Arctic. He resigned on January 21 to begin studies at Iowa State University.

George Blanchard made up a large number of study skins, including many specimens brought in from the field. He mounted a number of birds and mammals for school loan collection, renovated a mounted cougar and mountain sheep for exhibition, and worked on the mollusc collection stored in the sub-basement. During the absence of MacDonald he took over the direction of the zoology laboratory.

Stanley Gorham cleaned mammal skulls for the study collection and made up a number of study skins. He mounted some birds and helped renovate the school loan collection. He assisted in installing Peruvian exhibits at the Design Centre and in renovating the mollusc collection. Under direction of Langston, he set up a dermestid colony for the cleaning of skulls and skeletons.



John Crosby prepared illustrations, charts, and maps for the Museum and the Canadian Wildlife Service, including a series of pen-and-ink studies for Godfrey's publication "*Some Canadian Birds*". He made paintings for film strips on Canadian amphibians and reptiles, and renovated some exhibits. He visited the Royal Ontario Museum and exchanged information on the preparation of exhibits. A demonstration exhibit was prepared and shown at the meeting of the Ontario Historical Society at Kingston.

Miss V. M. Humphreys recorded and mapped bird distribution data for 1952 and began compilation data for 1953. Miss Humphrey accessioned specimens received and catalogued a large number. She distributed newly acquired specimens in the study collections, labelled the bird exhibit, and supervised the school loan collection. There were about 400 loans of bird and mammal specimens. Miss Humphreys represented the Museum on the Macoun Field Club Committee.

The numbers of specimens or lots of specimens in the Zoology Section at the end of the fiscal year were estimated as follows: mammals, 21,800; birds, 41,100; reptiles and amphibians, 9,200; fishes, lots of 1 or more, 2,100; invertebrates, 135,000; fossil vertebrates, catalogued specimens, 5,465.

## Publications

- Opening of the Saskatchewan Museum*, by Loris S. Russell. Bull. Can. Mus. Assoc., vol. 8, No. 2, 1955.
- Fort Ticonderoga Bicentenary*, by Loris S. Russell. Bull. Canada Mus. Assoc., vol. 8, No. 2, 1955.
- Recollections of some Alberta Museums*, by Loris S. Russell. Bull. Can. Mus. Assoc., vol. 8, No. 3, 1955.
- Additions to the Molluscan Fauna of the Kishenehn Formation, Southeastern British Columbia and Adjacent Montana*, by Loris S. Russell, Nat. Mus. Canada, Bull. 136, 1956.
- The Cattle Egret off Newfoundland*, by W. Earl Godfrey, Can. Field-Nat., vol. 68, No. 3, 1955.
- Beaks and Feet of Birds*, by W. Earl Godfrey, Canadian Nature, vol. 17, No. 4, 1955.
- Additional Notes on Birds of the East Kootenay, British Columbia*, by W. Earl Godfrey, Nat. Mus. Canada, Bull. 136, 1956.
- Four reviews of literature*, by W. Earl Godfrey, Can. Field-Nat., vol. 69, Nos. 1 and 2, 1955.
- One review of literature*, by W. Earl Godfrey, Can. Geo. Jour., vol. 51, No. 6, 1955.
- Some Physical Features of the Miramichi Estuary*, by E. L. Bousfield, Jour. Fisheries Res. Bd. of Canada, vol. 12, No. 3, 1955.
- The Cirripede Crustacea of the Hudson Strait Region, Canadian Eastern Arctic*, by E. L. Bousfield, Jour. Fisheries Res. Bd. Canada, vol. 12, No. 5, 1955.
- Viviparus viviparus L. in Eastern Canada*, by E. L. Bousfield, Can. Field-Nat. vol. 69, No. 1, 1955.
- Studies on the Shore Fauna of the St. Lawrence Estuary and Gaspé Coast*, by E. L. Bousfield, Nat. Mus. Canada, Bull. 136, 1956.
- Ecological Control of the Occurrence of Barnacles in the Miramichi Estuary*, by E. L. Bousfield, Nat. Mus. Canada, Bull. 137, 1956.
- One review of literature*, by E. L. Bousfield, Can. Geog. Jour., vol. 52, No. 2, 1956.
- Four Records of Atlantic Ridley Turtle, *Lepidochelys kempi*, from Nova Scotia Waters*, by Sherman Bleakney, Copeia, 1955, No. 2.
- Range Extensions of Amphibians in Eastern Canada*, by Sherman Bleakney, Canad. Field-Nat., vol. 68, No. 4, 1955.
- A Sauropod Dinosaur from Columbia*, by Wann Langston, Jr., and J. Wyatt Durham, Jour. Palaeontology, vol. 29, No. 6, 1955.

*A Juvenile Hadrosaur from the Oldman Formation of Alberta*, by C. M. Sternberg, Nat. Mus. Canada, Bull. 136, 1956.

*New Ideas for Exhibits*, by John Crosby, Bull. Can. Mus. Assoc., vol. 8, No. 4, 1956.

## Lectures

*New Discoveries of Fossil Vertebrates in Western Canada*, by Loris S. Russell. Biological Society, Queen's University, 16th November, 1955.

*Aspects of Bird Migration*, by W. Earl Godfrey, Friday Luncheon Discussion Club, Ottawa Y.M.C.A., 24th February, 1956.

*Introduction to film "Bear Country"*, by A. W. Cameron. Museum Children's Lecture Series, 29th October, 1955.

*Taking Your Own Nature Pictures*, by E. L. Bousfield. Museum Children's Lecture Series, 19th November, 1955.

*Snakes and What They Eat*, by Sherman Bleakney. Macoun Field Club, 1st November, 1955; Museum Children's Lecture Series, 5th November, 1955.

*Taking Pictures of Animals*, by Sherman Bleakney, Museum Children's Lecture Series, 19th November, 1955.

*Vertebrate Palaeontology at the National Museum of Canada*, by Wann Langston, Jr. Society of Vertebrate Palaeontology, 8th November, 1955.

*All about Dinosaurs*, by Wann Langston, Jr. Museum Children's Lecture Series, 11th February, 1956.

*All about Seals*, by S. D. MacDonald. Museum Children's Lecture Series, 3rd December, 1955.

*New Ideas for Exhibits*, by John L. Crosby. Ontario Historical Society, 22nd October, 1955.

## Accessions

### BY GIFT:

### Mammals

Banfield, A. W. F., Canadian Wildlife Service, Ottawa, Ont.: lemming skin and skull.

Buckner, Charles H., Forest Biology Laboratory, Winnipeg, Man.: 61 skins and skulls.

Cheney, H. W., Ottawa, Ont.: 7 black squirrels.

Cross William, Cascades, Que.: wolf (in flesh).

Dawkins, Sergeant Gordon, Ottawa, Ont.: fur seal skull.

Dodds, Donald, Newfoundland Department of Mines and Resources, St. John's, Nfld.: red fox skull, lynx.

Flook, Donald, R., Canadian Wildlife Service, Fort Simpson, N.W.T.: 43 skulls, 1 skin.

Höhn, E. O., University of Alberta, Edmonton, Alta.: 4 skins, 6 skulls.

Manning, T. H., Ottawa, Ont.: 36 collared lemmings.

Oliver, D. R., Department of Zoology, University of McGill, Montreal, P.Q.: 3 skins and skulls.

Peters, S. S., and L. M. Tuck, Canadian Wildlife Service, St. John's, Nfld.: black bear skull.

Pimlott, D. H., Department of Mines and Resources, St. John's, Nfld., and Dr. H. Hewitt, Department of Conservation, Cornell University, Ithaca, N.Y.: 2 red fox skulls.

### BY PURCHASE:

Höhn, E. O., University of Alberta, Edmonton, Alta.: 11 mammals.

### BY MUSEUM EXPEDITION:

Cameron, Austin, W., and W. John Smith, Museum Expedition to Labrador and Quebec: 125 mammals.

MacDonald, S. D., Museum Expedition to Ellesmere Island, N.W.T.: 31 mammals.

### BY STAFF MEMBERS:

Gorham, Stanley W., Ottawa, Ont.: wolf skin and skull from Quebec.

## By GIFT:

- Anonymous: tree swallow.  
 Bambrick, Mr. and Mrs. Ray B., Chelsea, Que.: evening grosbeak, chipping sparrow, wood duck, 2 eastern nighthawks, 2 yellow warblers.  
 Bennett, Charles, H., Ottawa, Ont.: white-throated sparrow, eastern nighthawk, chimney swift, 2 eastern goldfinches.  
 Blakely, D. J., Ottawa, Ont.: 5 skins.  
 Brown, Arthur, and E. Ardell: bald eagle.  
 Brown, Howard, Ottawa, Ont.: Rose-breasted grosbeak.  
 Campbell, J. Mitchell, Ottawa, Ont.: Western lark sparrow, Cape May warbler.  
 Charron, Roméo, Hull, Que.: oven-bird.  
 Cooch, F. Graham, Canadian Wildlife Service, Ottawa, Ont.: 14 skins.  
 Cowell, Fred. N., Timmins, Ont.: 15 skins.  
 d'Entremont, R. J., Ottawa, Ont.: nuthatch, 2 kinglets, 2 white-crowned sparrows, 2 white-winged crossbills.  
 Gillies, D. A. H., Ottawa, Ont.: black and white warbler.  
 Harper, Dr. Francis, Mount Holly, New Jersey: 13 birds.  
 Hassan, Alex, Ottawa, Ont.: black-billed loon.  
 Hennessey, T. H., Canadian Wildlife Service, Ottawa, Ont.: Baltimore oriole.  
 Höhn, E. O., University of Alberta, Edmonton, Alta.: 72 skins.  
 Jobin, Leo, Williams Lake, B.C.: baldpate.  
 Johnson, C. E., Ottawa, Ont.: 10 skins.  
 Leffler, Wendy, Ottawa, Ont.: ruby-throated hummingbird.  
 Lowther, J. K., Canadian Wildlife Service, Montreal, Que.: scaup duck.  
 Mackay, R. H., Canadian Wildlife Service, Vancouver, B.C.: 4 trumpeter swans.  
 McLaughlin, Dr., Ottawa, Ont.: Magnolia warbler.  
 Oeming, Albert, F., Edmonton, Alta.: barred owl.  
 Ouellet, Henri, Rivière du Loup, Que.: mourning dove.  
 Phillips, Allan R., Tucson, Ariz.: olivaceous flycatcher, Coues's flycatcher.  
 Rowley, Mrs. Graham, Ottawa, Ont.: oven-bird.  
 Scharf, Bob, Manotick, Ont.: mourning dove.  
 Shirley, C. F., Robb, Alta.: rosy finch.  
 Stirrett, Dr. George, M., Canadian Wildlife Service, Kingston, Ont.: Hudson Bay eider, long-eared owl.  
 Stunell, Linda, Ottawa, Ont.: American robin.  
 Tuck, L. M., Canadian Wildlife Service, St. John's, Nfld.: little egret, black-tailed godwit.  
 Waller, Sam, Cedar Lake, Man.: 2 brown-headed chickadees.  
 Webster, H. R., Canadian Wildlife Service, Edmonton, Alta.: and B. Hamm, Grand Prairie, Alta.: Swainson's hawk, Lapland longspur.  
 Wu, Po Chi, Ottawa, Ont.: cedar waxwing, willow thrush, veery.

## By PURCHASE:

- Höhn, E. O., University of Alberta, Edmonton, Alta.: 58 skins.

## By EXCHANGE:

- Museum of Natural History, University of Iowa, Iowa City, Iowa: 2 rosy finches.

## By MUSEUM EXPEDITION:

- Cameron, Austin, W. and W. John Smith, Museum Expedition to Labrador and Quebec: 41 skins.  
 Godfrey, W. Earl, and Ray d'Entremont, Museum Expedition to Southern Quebec: 502 skins.  
 MacDonald, S. D., Museum Expedition to Ellesmere Island, N.W.T.: 110 skins and preserved specimens; also eggs.

## BY MEMBERS OF STAFF:

Blanchard, George, Ottawa, Ont.: 24 skins.  
 Cutler, R. E., Ottawa, Ont.: cedar waxwing.  
 Dellaire, J. B., Ottawa, Ont.: 20 skins.  
 Godfrey, W. Earl, Ottawa, Ont.: indigo bunting.  
 Gorham, Stanley, W., Ottawa, Ont.: black-throated blue warbler.

## BY GIFT:

*Amphibians and Reptiles*

Cleghorn, J. D., Redpath Museum, Montreal, Que.: 2 snakes.  
 Cook, F. R., Nova Scotia Museum of Science, Halifax, N.S.: 2 salamanders.  
 Corbeil, H. E., Quebec Department of Fisheries, Quebec City, Que.: 22 salamanders.  
 Demers, A., Val Senneville, Abitibi, Que.: 2 spring peepers.  
 Dumais, R., Quebec Provincial Museum, Quebec City, Que.: 35 amphibians, 3 snakes.  
 Gamble-Robinson Ltd., Ottawa, Ont.: snake from Panama (among bananas).  
 Institute of Parasitology, Ste. Anne's, Que.: 14-foot long anaconda snake.  
 Legault, Romeo, National Grocers Co., Eastview, Ont.: snake from Equador (among bananas).  
 Lubinsky, Dr. G., Institute of Parasitology, Ste. Anne's, Que.: 20 snakes, lizard.  
 Phillips, B., Ottawa, Ont.: hog-nosed snake (alive).  
 Powers, J. and D. Oliver, Zoology Department, McGill University, Montreal, Que.:  
     mink frog, 8 tadpoles, 2 wood frogs and eggs.  
 Schad, Dr. G. A., Institute of Parasitology, Ste. Anne's, Que.: 127 snakes, toad.  
 Wilber, Mr. and Mrs. C. A., Verdun, Que.: 46 snakes, 65 lizards, turtle.  
 Wolfgang, Dr. R. W., Institute of Parasitology, Ste. Anne's, Que.: 2 frogs.

## BY PURCHASE:

General Biological Supply House, Chicago, Illinois: alligator skeleton.

## BY MUSEUM EXPEDITION:

Bleakney, J. Sherman, Museum Expedition to Montreal region, Que.: 138 amphibians,  
     22 reptiles.  
 Bleakney, J. Sherman, Museum Expedition to Nova Scotia and New Brunswick:  
     70 amphibians, 30 reptiles.

## BY MEMBERS OF STAFF:

Blanchard, George, Ottawa, Ont.: green snake.  
 Bleakney, J. Sherman, Ottawa, Ont.: 1 frog, 9 salamanders, 9 snakes.  
 Bleakney, J. Sherman and John Crosby, Ottawa, Ont.: 4 frogs, 9 snakes from Ontario.  
 Bousfield, E. L., Ottawa, Ont.: 24 amphibians, newt, British Columbia and Ontario.  
 Crosby, John, Ottawa, Ont.: 41 frogs and toads, 3 snakes, Western Canada.  
 Gorham, Stanley, W., Ottawa, Ont.: 30 amphibians, snake from New Brunswick.  
 Russell, L. S. Ottawa, Ont.: toad from British Columbia.

## BY GIFT:

*Fishes*

Wilber, Mr. and Mrs. C. A., Verdun, Que.: owlfish.

## BY EXCHANGE:

Department of Zoology, Tulane University, Louisiana: 12 fish specimens.

## BY MUSEUM EXPEDITION:

MacDonald, S. D., Museum Expedition to Ellesmere Island, N.W.T.: 9 fish specimens.



## By Gift:

*Invertebrates*

- Barnard, J. L., University of Southern California, Los Angeles, Calif.: 12 vials crustaceans, 6 vials marine amphipods.
- Bennett, Dr. H. J., Baton Rouge, Louisiana: 5 vials plankton.
- Carl, Dr. Clifford, and Dr. J. F. L. Carl, Victoria, B.C., and Biological Station, Nanaimo, B.C.: 136 vials marine amphipods and isopods.
- Carl, Dr. J. F. L., Provincial Museum of Natural History, Victoria, B.C.: a slide box Arctic amphipods.
- Drake, Robert, L., Tucson, Arizona: 5 lots of land snails.
- Edwards, C., Belfast, Ireland: a vial marine amphipods.
- Gesewitz, M., Ottawa, Ont.: blue crayfish.
- Grice, Dr. G. D., Florida State University, Tallahassee, Fla.: a jar marine amphipods.
- Fee, A. R., Pacific Biological Station, Nanaimo, B.C.: 2 sets of microscopic slides marine isopods.
- Hammond, G., Marmora, Ont.: 3 millipedes.
- Klawe, W. L., Atlantic Biological Station, St. Andrews, N.B.: 16 marine annelids, 11 vials marine crustaceans, a vial miscellaneous invertebrates.
- Mahoney, Brian, Ottawa, Ont.: fragment of coral.
- Oliver, D. R., McGill University, Montreal, Que.: 2 vials freshwater amphipods.
- Ontario Department of Planning and Development, Conservation Branch, Toronto, Ont.: 72 vials freshwater amphipods.
- Palmer, Ernst, Helsinki, Finland: 39 small and 4 large bottles of Newfoundland centipedes.
- Royal Ontario Museum of Zoology, Toronto, Ont.: 2 pint sealers miscellaneous amphipods, a jar freshwater amphipods.
- Squires, H. J., St. John's, Nfld.: 3 vials freshwater crustaceans.
- Wilber, Mr. and Mrs. C. A., Verdun, Que.: 15 lots terrestrial invertebrates.
- Williamson, D. I., Plymouth, England: 14 vials amphipods.

## By MUSEUM EXPEDITION:

- Bousfield, E. L., Museum Expedition to Canadian Pacific Coast: 94 vials, 40 one-half pint sealers, 9 pint bottles, 20 quarts marine invertebrates.
- Cameron, Austin W., Museum Expedition to Labrador and Quebec: 5 vials marine amphipods.
- MacDonald, S. D., Museum Expedition to Ellesmere Island, N.W.T.: 9 quarts, 4 pints, 22 one-half pints, 48 four-ounce jars, 22 vials marine invertebrates.

## By MEMBERS OF STAFF:

- Bousfield, E. L., Ottawa, Ont.: 32 vials marine and freshwater invertebrates from Eastern Canada.
- Bousfield, E. L., Ottawa, Ont.: 3 vials freshwater amphipods, 3 vials freshwater invertebrates, one lot freshwater invertebrates from Ontario and Quebec.
- Bousfield, E. L., Ottawa, Ont.: 202 vials arrow-worms, 29 vials copepods, 2 vials schizopods, a vial amphipods (Canadian Fisheries Expedition 1915-1916).
- Cameron, Austin, W., Ottawa, Ont.: 5 vials marine amphipods from Bermuda.
- Humphreys, Miss V. M., Ottawa, Ont.: one lot freshwater and land snails from Point Pelee, Ont.
- Macoun, John (estate), Ottawa, Ont.: 9 envelopes of West Coast molluscs, 1909.
- McKenzie, Donald, C., Ottawa, Ont.: a pair valves of *Lamsilis radiata* from St. Lawrence River.

## By Gift:

*Fossils*

- Connell, R., Victoria, B.C.: Tooth of the Oligocene desmostyliiform mammal *Cornwallius*, from Vancouver, B.C.
- Fowler, R. L., Aldersyde, Alta.: shell of large Paleocene turtle.
- Langston, W., Ottawa, Ont.: skull and mandible of the phytosaur *Machaeropsopos*, from the Triassic of New Mexico, collected in 1939.

## BY PURCHASE:

Troxell, E. L., West Hartford, Connecticut, U.S.A.: 400 specimens—mostly mammal teeth and jaws—from Eocene deposits in Wyoming.

## BY EXCHANGE:

Cleveland Museum of Natural History, Cleveland, Ohio, U.S.A.: a cast of the cranial and pectoral plates of the giant Devonian fish *Dinichthys*, from Ohio.

Royal Ontario Museum, Toronto, Ont.: skeleton of the horned dinosaur *Styracosaurus*, from Alberta.

Royal Ontario Museum, Toronto, Ont.: cast of the tooth of the Paleocene mammal *Pantolambda*, from Alberta.

Saskatchewan Museum of Natural History, Regina, Sask.: two plaster casts of the horn core of an Oligocene brontothere from Saskatchewan.

## BY MUSEUM EXPEDITION:

Lindblad, G. E., expedition to Red Deer River badlands of Alberta: skull and other bones of the duckbilled dinosaur *Edmontosaurus*, small parts of two horned dinosaur skulls, and miscellaneous dinosaur bones.

Russell, L. S., and W. Langston, survey expedition to fossil vertebrate localities in Manitoba, Saskatchewan, and Alberta: 350 specimens of Cretaceous and Tertiary vertebrates, including a large collection of Miocene mammal teeth and bones from Saskatchewan, and a skull of the large ceratopsian dinosaur *Pachyrhinosaurus* from Alberta.

## BY MEMBERS OF STAFF:

Langston, W.: a collection of Permian vertebrates remains comprising several thousand reptile and amphibian bones, from Oklahoma

## BY TRANSFER OF SPECIMENS FROM THE GEOLOGICAL SURVEY OF CANADA:

Thirty-five specimens of Pennsylvanian amphibian and reptile remains from the erect stumps of South Joggins, N.S., collected in 1911 by W. A. Bell. Thirteen specimens of Devonian and Jurassic fishes comprising four collections (1942, 1945, 1949, 1952) made by D. J. MacLaren.

## NATIONAL HERBARIUM

## Field Work

A. E. Porsild, Chief Botanist, returned from a year spent in Europe, where he had carried on extended herbarium and library research, mainly in London, Paris, Copenhagen, and Oslo. He resumed his duties at the National Herbarium on May 11.

H. J. Scoggan conducted a botanical survey of New Brunswick from June 3 to August 26, with minor excursions into adjacent parts of Quebec. A total of 1,461 numbers of specimens of ferns and flowering plants was collected with sufficient duplicate material to make up 4,811 additional sheets for exchange.

H. A. Crum, accompanied by W. B. Schofield, spent the period June 1 to August 12 in the Rocky Mountains of Alberta. A total of 3,216 numbers of specimens (mostly bryophytes) was collected, with enough duplicate material for some 21,000 exchange specimens.

## Office Work

A. E. Porsild completed work on the manuscript for his *Flora of the Canadian Arctic Archipelago*. He also checked and revised printer's proofs of his *Vascular Plants of the Western Canadian Arctic Archipelago*. On

December 6 he commenced work on a manual of the *Flora of the Rocky Mountain National Parks*, which will be based largely on field work done in the field seasons of 1945, 1946, 1951, and 1956. A paper entitled *Age and History of the Flora of the North American Arctic Archipelago* was prepared for presentation at a symposium on arctic-alpine floras at the Annual Meeting of the American Institute of Biological Sciences in September, at East Lansing, Mich. He prepared a report on his work in Europe for the year book of the American Philosophical Society and reviewed some twenty papers and manuscripts submitted to various Canadian scientific journals for publication.

Considerable time was spent annotating and cataloguing 300-odd enlarged photographs which he had made in European herbaria of types or of critical Canadian plants, as well as of letters dealing with important aspects of early botanical exploration in Canada. Assisted by H. J. Scoggan, he planned a series of botanical range and vegetation maps for the *Atlas of Canada*.

On seven occasions he attended meetings of the executive and various sub-committees of the Ninth International Botanical Congress, and meetings of the Board of Governors and committees of the Arctic Institute of North America, of which he is a Governor and Secretary.

The balance of his time was spent in routine checking and determination of plant material submitted to the National Herbarium from other institutions and various Government Departments, as well as in checking and selecting material for mounting and insertion in the National Herbarium.

H. J. Scoggan determined his 1955 collection and catalogued it in a card-index system. He also entered citations and notes concerning the flora of the Atlantic Seaboard of Eastern Canada, for a proposed flora of that region toward which the present program of field work is directed. Some 500 plants submitted by various institutions and individuals were determined and reported on, and 14,589 sheets of duplicate material collected during the period 1948-53 in Manitoba were sorted into nine sets for exchange. Considerable time was spent preparing plant distribution maps for the *Atlas of Canada* and, with W. K. W. Baldwin, work was completed on a film-strip "Spring Flowers of Eastern Canada". A portion of the printer's proof of *Flora of Manitoba* was checked.

H. A. Crum determined and catalogued his collection. In addition he determined 2,556 specimens of bryophytes submitted by various institutions and individuals, and revised the original determinations in several families and genera already in the cryptogamic herbarium. He continued his monographic studies on the *Funariaceae* and *Splachnaceae*, completed eight manuscripts for publication, edited four issues of *The Bryologist*, and supervised the preparation of a 50-year index. He supervised the routine curatorial work in the cryptogamic herbarium and the reorganization of the moss herbarium. He attended the annual meetings of the American Institute of Biological Sciences held at Michigan State University, spent eight days of study at the New York Botanical Garden, and three weeks at the Grout Herbarium at Duke University.



W. K. W. Baldwin reviewed his collections of the past three field seasons in the Clay Belt of Ontario and Quebec, wrote an annotated catalogue and a check-list, and worked on an analysis of the Clay Belt flora and other material for the publication of this study. He checked and determined some early collections by a former Chief Botanist, M. O. Malte, of some critical sections of *Carex* and *Compositae* for insertion in the National Herbarium and, in addition, determined 349 plant specimens from the Clay Belt submitted by private individuals. He prepared spore and pollen samples for the Pleistocene studies of J. Terasmae of the Geological Survey and assisted R. Moir of North Dakota Agricultural College in the study of the latter's collection from Fort Severn, Ont. He gave botanical and other assistance in the photographic recording of Robert Holmes' coloured slides of wild flowers from the Art Gallery of Toronto, made an appreciative survey of plant illustrations for Museum use in film strips, loans, and lectures, and, with H. J. Scoggan, arranged material and data for a film strip on spring wild flowers of Eastern Canada.

Miss H. T. Harkness was responsible for the mounting, inserting, labelling, cataloguing, and general care of specimens in the Herbarium, and for the loan and exchange service. Specimens of vascular plants mounted totalled 4,518 and, together with 6,220 mounted the previous year, were inserted into the general Herbarium; 196 type specimens were indexed; 4,367 cryptogamic specimens were packeted and inserted, and 2,424 were sent out on loan. In addition, she prepared an index for National Museum, Bulletin 135 (*Vascular Plants of the Western Canadian Arctic Archipelago*, by A. E. Porsild), and prepared 400 maps of plant distribution.

### Accessions, Loans, and Exchanges

During the year, 4,643 herbarium specimens were received by exchange, 2,933 by donation, and approximately 32,269 resulted from field work or were obtained in exchange for determination by members of the National Museum staff. Specimens numbering 1,966 were sent on loan to other botanical institutions, and 361 were borrowed from them. Duplicate specimens, 20,407 in number, resulting from the field work of the Herbarium staff, were distributed to Canadian and foreign herbaria in continuation of exchanges. A total of 3,794 specimens of vascular plants was mounted and inserted in the herbarium, bringing the total number of mounted vascular plants in the National Collection to 236,641. A total of 10,966 specimens of cryptogamic plants was packeted and inserted in the herbarium. The collating and indexing of 196 type specimens brings the number of indexed types of vascular plants in the herbarium to 1,702.

Among the more notable accessions are 300 enlarged photographs of types and critical plant specimens photographed by A. E. Porsild in European herbaria and 340 alpine plants of arctic affinity collected by him in high parts of the Pyrenees and French Alps; the collection of 317 plants from Ontario, by J. A. Bailey; 132 plants from King William Island, by Mrs. P. F. Cooper; 47 plants from the Belcher Islands, by Claude Desgoffe; 41 plants from Ungava, by Francis Harper; 119 plants from the east coast of James Bay, by E. Lepage; 52 plants from Ellesmere Island, by S. D. MacDonald; 115 plants from Banks Island, by E. H. McEwen; 1,468 mosses of western Canada, by Mrs. Fay A. MacFadden; Philadelphia



Academy of Natural Sciences, Philadelphia, Pa., 256 plants from Alaska and the western United States; and 227 plants from the Northwest Territories and Ungava, made by J. S. Tener; all of which the National Museum gratefully acknowledges.

The National Museum also acknowledges with thanks the donation of the following collections:

- Ando, H., Hiroshima, Japan: 2 mosses from Japan.
- Coates, K., Fort William, Ont.: plant from Ontario.
- Cowell, F. N., Timmins, Ont.: 34 plants from Ontario.
- Culberson, W. L., Duke University, Durham, N.C.: 3 lichens from the United States.
- Cunningham, G. A., Ottawa, Ont.: plant from Ontario.
- Haring, Mrs. I. M., Poughkeepsie, N.Y.: 21 mosses from the United States.
- Heimbürger, C., Maple, Ont.: 8 plants from the United States.
- Lefebvre, G., Montreal, Que.: 38 plants from the Belcher Islands.
- Lloyd, H., Ottawa, Ont.: plant from Ontario.
- MacNeish, Mrs. R. S., Ottawa, Ont.: 37 plants from Firth River, arctic coast of Yukon Territory.
- Manitoba Plant Pathology and Cereal Breeding Laboratory, Winnipeg, Man.: 84 plants from Manitoba.
- Mann, Miss B. G., Ottawa, Ont.: 8 portfolios of plants collected by Dr. G. G. Bird in 1845 near Bowmanville, Ont.
- Maycock, P. F., Winona, Ont.: 30 plants from Michigan and Minnesota.
- Miller, H. A., University of Massachusetts, Amherst, Mass.: 15 bryophytes from the United States.
- Mills, G. M., New Liskeard, Ont.: plant from Ontario.
- Ontario Lands and Forest Department, Kapuskasing, Ont.: 2 plants from Ontario.
- Schnoorberger, Dr. Irma, Flint Junior College, Flint, Mich.: moss from Michigan.

## Publications

The following papers were published by the staff of the National Herbarium during the year:

- The Vascular Plants of the Western Canadian Arctic Archipelago, by A. E. Porsild, National Museum of Canada Bulletin 135: 1-226 (1955).
- The North American Races of *Saxifraga flagellaris* Willd., by A. E. Porsild. Bot. Tidsskr. (Copenhagen) 51: 292-299 (1954).
- Tayloria splachnoides* and *T. acuminata* in America, by H. A. Crum. Rev. Bryol. et Lichenol. 24(3-4): 215-221. 1955 (1956).
- Review: Franz Schommer's Kryptogamen-Practicum . . . , by H. A. Crum. The Bryologist 58: 260-261 (1955).
- Notes on *Hypnodon*, a genus of *Orthotrichaceae* new to North America, by H. A. Crum. The Bryologist 59: 26-34. Figs. 1-12. (1956).
- Two Rare Bryophytes New to Canada, by H. A. Crum. The Bryologist 59:35 (1956).

## Lectures

- The Alpine Flora of the Rocky Mountains*, by A. E. Porsild, Danish Botanical Society, November 6, 1954.
- Age and History of the Flora of the North American Arctic Archipelago*, by A. E. Porsild, American Institute of Biological Sciences, East Lansing, Mich., September, 1955.
- Robert Holmes' Wild Flowers*, by W. K. W. Baldwin, Quebec Society for the Protection of Birds, Montreal, Que., April 11, 1955.
- Forests*, by W. K. W. Baldwin, Macoun Field Club, Ottawa, Ont., March 6, 1956.

## ARCHÆOLOGICAL INVESTIGATIONS ON SOUTHAMPTON AND WALRUS ISLANDS, N.W.T.

*By Henry B. Collins*

In June 1955, the writer, accompanied by J. Norman Emerson, William E. Taylor, Jr., and James V. Wright, returned for a second season's archæological work at Native Point on Southampton Island. The expedition was sponsored by the National Museum of Canada, the Smithsonian Institution, and the American Philosophical Society. On June 8, we left Montreal by R.C.A.F. aircraft for Churchill, where we stayed overnight and picked up a supply of military rations, and arctic clothing and tents kindly supplied by the U.S. Quartermaster Corps. Arriving at Coral Harbour next morning we went by Eskimo dog-team to the Hudson's Bay post 7 miles away, where A. T. Swaffield, Post Manager, had arranged for our sled trip to Native Point, 40 miles down the coast. As recent rains had left the sea ice very wet and difficult for sled travel, we waited several days for conditions to improve. On June 13 we left for Native Point with our summer's supply of food and camping equipment, loaded on five dog sleds driven by the Eskimos Peter Bruce, Killigpalik, Napayuk, Yaki, and Ben Ell. The ice was rough and in bad condition—worse than in the previous year—with much surface water and numerous open leads. We stopped for the night at Prairie Point, midway to Native Point, and had an opportunity to examine the old Sadlermiut village site described by W. D. Bell (Bird, 1953). It consisted of fifteen typical Sadlermiut house ruins of stones and sod, two made entirely of stones, and a number of stone caches, cairns, and tent rings. The houses appeared to be about the same age as the more recent ones at Native Point and had probably been abandoned some fifty years ago. Arriving at Native Point on June 14 we set up camp and worked for the rest of the summer except for five days in July spent on Walrus Island.

### Sadlermiut Site (S)

This is the large village site (Tunermiut) of almost one hundred house ruins, once the principal settlement of the Sadlermiut Eskimos. It consists, for the most part, of the fairly well-preserved stone and sod house ruins left by the Sadlermiut (the last of them occupied up to the winter of 1902-3 when the tribe became extinct), the filled-in pits of older Sadlermiut houses, and about a dozen old *qarmats*, or autumn houses, built by Aivilik Eskimos who lived at the site in recent years. Our work in 1955 was confined mainly to continuing excavations in the 25- by 40-foot area in the centre of which was the shallow, filled-in depression of House 30, which had been selected in 1954 because it appeared to be one of the oldest house ruins at the site (Plate I, B). Excavating by 5-foot squares, we proceeded slowly because of the great quantities of animal bones and refuse that had to be removed. The excavation yielded a large collection of Sadlermiut artifacts similar to those described by Mathiasen (1927) and Boas (1901-7) from

other Sadlermiut sites on Southampton, and a few Dorset harpoon heads which, no doubt, had been picked up at the nearby Dorset site, T 2. There appeared to be no cultural difference between the artifacts found in the upper sod layers, which represented refuse from adjacent houses deposited after House 30 had been abandoned, and those found at deeper levels in the house itself. Several test pits were also sunk in middens at different parts of the site. Mapping of the site and surrounding terrain, including the Dorset sites, was completed by J. N. Emerson.

### T 1 Site

One mile east of the Sadlermiut site is the early or proto-Dorset site which we have called T 1, from Tunermiut, the Aivilik Eskimo name for Native Point. It is situated on the top of a 70-foot-high plateau or headland, now half a mile back from the sea (Plate I, A). The site consists of shallow midden deposits covering an area of well over 20 acres, though the deposits are not continuous. There were no house depressions or other surface irregularities, and our excavations revealed no clear evidence of houses or other structures except hearths and occasional arrangements of flat stones. The stones, however, seemed too small and too random in their placement to have served as floors.

The top of the T 1 plateau slopes gently from the north, where it begins as a 25-foot-high bluff, to the southern end where it merges into the adjacent lowland. On the top of the plateau a series of low ridges—old beach lines—extend in curving rows from east to west. The midden deposits are concentrated mostly on the flat northern and western sections of the plateau where the old ridges are low and indistinct. The surface is dry and broken up into small hummocks. The vegetation cover is low and sparse, consisting of small isolated clumps of grass, moss, lichens, saxifrages, *Dryas*, *Draba*, and a scattering of other low growing plants. To the south and east the old beach ridges are more prominent, and here, between the ridges where moisture is retained longer, there is a denser growth of the same kind of vegetation. Culture refuse is scarce in these lower areas where the vegetation is thicker, and abundant on the ridge tops where it is sparse—the reverse of the usual situation where midden deposits support a more luxuriant vegetation. This may be taken as an indication of the age of the T 1 middens, the nutritive elements having long since been absorbed.

Animal bones, flint chips, and implements and other artifacts occur at the very surface, embedded in the one-inch-thick turf and throughout the underlying brownish-black culture layer which extends for an average depth of 7 to 11 inches and a maximum depth—in Midden 4—of 20 inches. No part of the site is frozen. Bone, ivory, and antler is for the most part solid and well preserved, though many pieces are weathered and all are patinated. There is no trace of wood or other organic material in the middens, though wood must have been used for many purposes such as harpoon shafts and knife handles. A date of  $2060 \pm 230$  years was obtained by the University of Pennsylvania Carbon 14 Laboratory from samples of charred bone from Test Pit 6 on the northeast edge of the plateau.

All excavated animal bones were saved and counted. The bird bones were brought back to the U.S. National Museum for identification, but mammal bones as far as possible were identified in the field. Over 25,000



mammal bones were excavated and counted in 1954, and of these 3,000 were identified. The bones excavated and identified in 1955 have not yet been tabulated, but the proportions remain the same as reported for the previous year (Collins, n.d.; 1956). The fact that seal bones comprise over 60 per cent of all the mammal bones shows that this was the principal food animal of the early Dorset people. Next came the walrus, bearded seal, and fox. Polar bear and caribou were represented by less than one per cent of the bones, and dog bones were completely absent. Relatively few mammal bones were found in Midden 4 and other cuts in the eastern part of the site, but bird bones were more abundant, suggesting that this part of the site had been occupied in summer. There are also some indications of cultural differences between the eastern and western parts of the site.

Typical artifacts excavated at T 1 in 1955 are illustrated on Plates IV to XIII. They are intended to supplement the larger body of material previously described and illustrated (Collins, n.d.). Fourteen 5-foot squares were excavated in 1955. Four of them (Test Pit 14 and three squares in Midden 4) were in the eastern part of the site. The others were in the western section and included Midden 5, Test Pit 12, and Trench A (seven squares) adjacent to Midden 1.

A piece of a heavy shoe for a hand-drawn sled is shown in Plate IV, figure 1. It is made of whalebone and is 4.4 cm. wide and 1.6 cm. thick. At the upper rounded end is a deeply countersunk hole and transverse lashing groove, by means of which the shoe was lashed to the runner. Another hole had been cut through the centre 14 cm. from the end. A narrow groove, 6 mm. deep and 3 mm. wide, extends along the entire length of the left edge. The under surface of the runner, illustrated, is smooth from wear. This was the only whalebone artifact found.

Plate IV, figure 2 is an ivory lance head of unusual type, with a wide, shallow open socket and opposite lashing groove and a pointed spur with central perforation. The left edge is sharpened; the right edge is thicker and encloses a side-blade socket 2.7 cm. long, 3 mm. wide, and 7 mm. deep; the upper end is broken off. The basal ends of lances of this kind were fairly common at T 1, showing it to have been one of the more important implement types. Similar lances have been described by Wissler (1918, p. 125) from Rensselaer Harbor, Smith Sound, and by Knuth (1952, figure 11, 1) from Pearyland. A toy lance head of the same type is shown on Plate IV, figure 13. The two most common types of harpoon heads are illustrated on Plate IV, figures 3 and 4. Both have the usual Dorset closed rectangular socket, two spurs, a tapering slot cut through to connect with the socket, and a slit for an end blade parallel with the socket. In figure 3 the line hole is cut through the thickened upper surface so that both ends of the hole emerge on the same side. The opposite side is flat and has a large hole cut through to connect with the line hole. Figure 4 has a single line hole, and on the upper side (illustrated) the surface is bevelled from above the line hole to the tips of the spurs. Figure 5 is the basal end of a barbed harpoon head like one previously illustrated (Collins, n.d., Plate III, figure 27). A harpoon foreshaft with flat tapering end, suitable for a rectangular harpoon socket, is illustrated in Plate IV, figure 6. The broken ends of three barbed darts are shown in figures 7 to 9.



Next to stone implements, needles made from bird bones were the most numerous artifacts found at T 1. Two of them are illustrated on Plate IV, figures 10 and 11. The eyes of the needles are tiny oval slots, countersunk on both sides, and the upper ends are pointed. The tips are almost as sharp as on steel needles. A piece of a needle-case made from the hollow proximal end of a baby walrus tusk is shown on Plate IV, figure 19. A characteristic feature of these needle cases is the presence of two small bosses or knobs, opposite each other, suggestive of the ears of an animal. Plate IV, figure 12 is an example of one of the most common implements at T 1, a small composite ivory handle with a small shallow socket for holding a stone blade, probably a slender spall like those shown on Plate VI. The two halves of the handle were lashed together by means of grooves at both ends, enclosing the flint blade which projected at one end. Plate IV, figure 15 is probably the tip of a lance head; a slot is cut through the upper end for lashing on a blade which fitted into a bed on the opposite side. Five examples of flint flakers are shown on Plate IV, figures 16, 17, 18, 20, 21; all are made from the tough heavy bone of a walrus maxillary or mandible. Figure 21 differs from the others in that the upper end is wide and flat. Figure 22 is the distal end of a small walrus tusk from which strips of ivory have been removed by means of a burin or similar cutting tool. Figure 23 is the proximal hollow end of a small walrus tusk with two polar bear heads carved at one end; there is a longitudinal slit down the centre of the side not illustrated. Plate IV, figure 24, made from a piece of a seal scapula, has the appearance of a harpoon rest to be lashed to the deck of a kayak. An oval slot through the spine would have held the lashing thong. All edges are smoothly worn. A broken ivory knife or scraper is shown on Plate IV, figure 25, and the upper end of a similar implement in figure 27; both edges are sharpened. Two ivory objects of unknown use are illustrated on Plate IV, figures 14 and 26.

Stone implements comprised the great bulk of the artifacts found at T 1. Most of them were made of a lustrous smooth-textured chert ranging in colour from a light grey to almost black. Next in importance was a more granular or gritty variety of chert which was used mostly for making some of the spall implements (Plate VI, figures 20, 21, 24, 25, 28) and those with rubbed edges (Plate V, figure 19; Plate VI, figure 44). Rock crystal was used for making micro-blades, small end-scrapers, and tiny, tanged knife blades. Lamps and cooking pots were made of soapstone, but as only a small number of sherds were found they must have been rare. The only other varieties of stone used were slate and nephrite, each represented by less than a dozen pieces.

Various kinds of end blades, side blades, and scrapers from T 1 are illustrated on Plate V. Triangular end blades, probably for harpoons, are shown in figures 1 to 7. The bases are straight or slightly concave; the typical Dorset blade with deeply concave base was not found at T 1. What the two narrow end blades shown in figures 8 and 9 were used for is uncertain; both have a prominent median ridge on the outer surface, a feature often seen on T 1 end blades and occasionally on other implements. Plate V, figure 12 is probably an end blade for a knife or lance. This and most of the other end blades are made from flakes with the bulbar surface unmodified or only slightly worked. The long, straight-edged side blade shown on Plate V, figure 13 rather closely resembles examples from Early

Neolithic and Mesolithic sites in Siberia and Mongolia (Okladnikov, 1950, figure 62; Maringer, 1950, Plate XXX, figures 1, 3, 5). Side blades of this kind were especially characteristic of the eastern part of the T 1 site. A small oval side blade is shown on Plate V, figure 10. The basal ends of three blades, either knives or scrapers, are shown in figures 11, 15, and 16. All are notched, and figure 16 has multiple notches, a characteristic Dorset feature. Two end-scrapers are shown on Plate V, figures 14 and 17. Figure 18 is a flint disc, the natural product of frost or heat action; the edges are retouched, indicating that it was used for cutting or scraping. Plate V, figure 19 is an unfinished adz-like scraper, the lower edge of which, if completed, would have been abruptly bevelled. Figure 20 is the rim sherd of a soapstone cooking pot; the edge and outer surface just below it are both planed.

Micro-blades (lamellar flakes) were the most numerous of all implements at T 1. Those illustrated here (Plate VI, figures 1-14) range in length from 4.4 cm. (figure 1) to 1.3 cm. (figure 14). Figure 5 is a thick heavy flake worked along the edges and at the bulbar end. Figure 6 has the lower edges worked at the bulbar end to form a tang; such blades, which are common at T 1, were evidently inserted in the end of a handle, probably of wood, and used as knives. The symmetrical and delicately made T 1 micro-blades could only have been struck from carefully prepared cores. But despite the abundance of blades, not one really good core was found. The cores were probably used and re-used until exhausted. Plate VI, figure 15 is unusual because of its lanceolate shape and also because the upper end of the bulbar surface is carefully retouched. The two short thick flakes shown on Plate VI, figures 17 and 19, might be described as backed blades. They are triangular in cross-section with one edge sharp for cutting and the thick opposite edge blunted by steep flaking. Figures 16 and 18 are similar except that the thick edge is only slightly chipped. Figure 20 is a thick spall with the outer surface and upper end retouched. Eight small implements resembling burin spalls are illustrated on Plate VI, figures 21 to 28. Most of the spalls of this kind, however, were probably not produced from burins because only a few good examples of the latter from flakes of various kinds were found. Figures 24 and 28 were struck from "burin-like" implements with rubbed edges and sides, such as the one shown on Plate VI, figure 44. The spalls seem to have been produced intentionally for fine cutting or gouging, for many of them, like those described by Giddings (1956) from Cape Denbigh and Knife River, have one end carefully retouched.

On Plate VI, figures 29 to 39 and 41 to 43, are shown fourteen examples of the triangular microliths so characteristic of T 1. They are all made from flakes with the bulb of percussion at the upper narrow end; the bulbar face is unworked and the outer face, illustrated, is usually covered more or less completely by shallow surface flaking. The lower end is sometimes retouched. These implements fall into six principal types, depending on the manner in which the edges were treated, as follows:

- A. One edge dulled, opposite edge with long flake removed (Plate VI, figures 29-35, 41, 42).
- B. One edge dulled, opposite edge sharpened by chipping (Plate VI, figure 36).
- C. One edge dulled, opposite edge sharp from original flake (Plate VI, figure 43).

- D. One edge with flake removed, opposite edge with smaller flake removed (Plate VI, figure 37).
- E. One edge with flake removed, opposite edge sharpened by chipping (Plate VI, figure 38).
- F. One edge with flake removed, opposite edge sharp from original flake (Plate VI, figure 39).

The exact function of these microliths is doubtful. Some have the appearance of side blades and may have been so used. In many cases, however, both edges are dull, one from steep flaking and the other by removal of a single longitudinal flake, so that the blade would not have been effective for cutting. When a flake was removed from one edge, which was usually the case, it was struck off with a burin blow from the bulbar end of the blade. In such cases the intention seems to have been to produce a narrow tip suitable for gouging, like that of a burin. As many of the tips, in fact, are battered and worn, they must have been used in some such way. We may therefore recognize the possibility that some of these T 1 implements may represent a new and delicate form of burin, designed for the fine cutting and slotting so characteristic of the site.

Plate VI, figure 40 is the best example of a burin from T 1. It has a distinctive negative bulb of percussion and a series of niches or jags where successive spalls had been removed. Four smaller spalls had been removed from the left edge. Plate VI, figures 44 and 45 are two examples of Dorset "burin-like" implements with rubbed edges and sides. Figure 44 is the typical T 1 form and is made of a tough, gritty variety of chert, the rubbed surfaces of which have acquired a whitish patina. Figure 45 is of nephrite, one of the few implements of any kind made of this material.

The T 1 site has close cultural affinities with the Dorset culture as previously known and also with the earlier pre-Dorset flint sites to the west, such as Cape Denbigh, Anaktuvuk, Campus Site, and Pointed Mountain. It shares with these earlier sites several features, such as micro-blades, burins, and burin spalls, that show connections with the Old World Mesolithic. T 1 also exhibits two additional Mesolithic features—backed blades and long straight-edged side blades. Another of its characteristic implements—the slender triangular microliths (Plate VI, figures 29–39, 41–43)—in their general shape and in the blunting of one edge are more suggestive of Mesolithic forms, particularly Tardenoisian, than anything known from America.

In assessing the position of T 1 in relation to the Dorset culture as a whole we observe that the following typical Dorset features are present at T 1:

Barbed dart points, needles, micro-blades, cores (rare), burins, small triangular projectile points, burin-like implements and adz-like scrapers with rubbed edges and sides, flat sled bone shoes, and soapstone vessels.

Moreover, the general Dorset character of the T 1 material is indicated by such features and tendencies as closed rectangular sockets on harpoon heads, the small and delicate nature of the implements, the presence of a simple straightline incised ornamentation and of gouged instead of drilled holes in bone and ivory artifacts.



On the other hand the following typical Dorset features are lacking at T 1:

Closed socket harpoon heads with two line holes, open socket heads with single spur and line hole at edge, harpoon foreshafts with lateral line hole, small knife handles with long deep side sockets, ivory runners for hand sleds with ends fitted together, ivory spatulas, projectile points with deeply concave bases, end-scrapers with expanded edges, concave side-scrapers, asymmetric knife blades, grotesque human and animal carvings, and stylized chevron and other incised designs.

The absence of these features seems significant, in view of the fact that the T 1 collection is considerably larger than that from any other Dorset site.

A number of the T 1 types are new, not only to the Dorset but to any other culture. In this category are most of the types that are particularly characteristic of the site, such as the small composite handles or sockets (Plate IV, figure 12), flaking hammers (Plate IV, figures 16-18, 20, 21), spatulate knife-like implements (Plate IV, figures 25, 27; Collins, n.d., Plate IV, figures 26-30), large blades with slanting base (Collins, n.d., Plate VII, figures 18-20), large parallel-edged side blades (Plate V, figure 13), micro-blades with tangs (Collins, n.d., Plate X, figures 23-26, Plate XI, figures 15-22), backed blades (Plate VI, figures 17, 19; Collins, n.d., Plate X, figures 10-17), micro-blades and other very small implements of rock crystal (not illustrated), and triangular microliths (Plate VI, figures 29-39, 41-43).

The resemblances and differences between T 1 and other Dorset sites in Canada and Greenland show that, although its general character is Dorset, it cannot be equated with the Dorset culture as previously known. It might more properly be considered as formative or proto-Dorset.

### T 3 Site

This was a small site on the crest of a gravel ridge, an old beach line, at the base of the T 1 plateau. It is 25 feet lower than T 1 and 45 feet above sea-level. An area 20 feet square (containing 16 five-foot squares) was staked off to enclose the greater part of the surface where a sparse growth of saxifrages, mosses, lichens, and other low-growing vegetation suggested the presence of an old site (Plate II). Surface conditions were similar to T 1, but the plant cover was thinner and the occupation level reached a maximum depth of only 9½ inches. Cultural material, including flint rejectage, was much less abundant than at T 1, and mammal bones were also relatively scarce. Bird bones, on the other hand, were abundant especially in squares 6, 9, and 11; 11,307 complete or fragmentary bird bones were excavated and counted. The finding of most of the characteristic T 1 implement types also at T 3 indicated that there was no great age difference between the two sites. However, several new types were present, and differences were also observed in some of the harpoon heads. These minor cultural differences and the fact that the site was at a 25-foot-lower elevation suggest that T 3 represents a slightly later phase than T 1.

Representative implements from T 3 are illustrated on Plates VII to IX. The flat ivory object with notched base shown on Plate VII, figure 1 is part of a shoe for a handdrawn sled, another section of which would have



fitted into the notch at the lower end. A large slot 1.7 cm. long was cut through from side to side for the thong that fastened it to the runner. The under side is somewhat rounded and smooth from wear; the upper side (illustrated) is perfectly flat and has two notches 1.8 cm. wide above the lashing slot for holding the thong in place. Three of the harpoon heads (Plate VII, figures 2, 4, 5) are types that occur at T 1. Figure 6, which has a slit for an end blade parallel with the rectangular enclosed socket, differs from T 1 examples in its more slender shape and in having the area around the line hole on the opposite side sunken instead of bevelled. Figure 3 appears to be a later form of the T 1 head shown on Plate IV, figure 3. It is closely similar to a harpoon head found in 1954 at the later Dorset site T 2 (Collins, n.d., Plate III, figure 19), a form which on typological grounds seems to have developed into the modern Sadlermiut head. These later forms differ from the T 1 examples in being wider at the tip, flat instead of slightly rounded on the under side, and in having the line hole cut through directly from left to right instead of curving down and across through the upper side. They also lack the slot on the under side which opens into the line hole. Plate VII, figure 7 is the lower end of a barbed harpoon or dart, and figure 8 is the base of a lance head like the one from T 1 shown on Plate IV, figure 2.

Barbed darts of various kinds, a large bone awl, needles, and a piece of a bird bone, from which needles were cut, are illustrated on Plate VII, figures 9 to 21. Figure 22 is an ivory needle-case made from the hollow end of a young walrus tusk. Two rectangular projections are carved in relief on the sides. It is of interest to observe that these little knobs, a characteristic feature of Alaskan needle-cases, occur also in the Dorset culture. Plate VII, figures 23 and 24 are small composite knife-handles like those from T 1, with narrow sockets in the straight inner edge. Figure 25 differs from the T 1 type in being flatter and wider and in having a larger socket, 3.8 cm. long, 3 mm. wide, and 3 mm. deep. Three flaking tools of heavy walrus bone and an antler wedge are shown on Plate VII, figures 26 to 29. Figure 30 is a flat knife-like ivory implement like those from T 1. Four ivory implements are illustrated in figures 31 to 34; what these were used for is uncertain. Figure 35 is a section of polar bear maxillary containing three of the incisor teeth, the proximal ends of which, with the surrounding bone, have been smoothly cut; figure 36 is polar bear canine, similarly cut. Figure 38 is a small triangular piece of ivory, probably removed when cutting out the lower end of a harpoon head. A bone tube, two pieces of worked bone, and a fragment of an antler receptacle are shown on Plate VII, figures 37, 39 to 41. Figures 42 and 43 are nodules of iron pyrites; the lower ends are battered and worn suggesting use as hammers. Rounded lumps of pyrites for making fire, which were common at the Sadlermiut site and burials, were not found at T 1 or T 3. Figure 44 is a scraper or rubbing tool with smooth rounded end made of walrus rib.

End blades and rectangular side blades for projectiles (Plate VIII, figures 1-7, 10, 11) correspond to types from T 1. Figure 8 is unique for its symmetrical lanceolate shape and its rounded upper surface which gives it an unusual thickness; the under surface is unworked and has a sharp ridge down the centre. Figure 9 is a heavy flake with fine chipping over the entire upper surface and part of the flat bulbar surface. Figure 12 is

similar in shape but worked only on the outer surface. Figure 13 is a long, narrow biface implement, probably a knife, unlike any from T 1 but resembling a Dorset blade from Cornwallis Island (Collins, 1952, Plate XII, figure 3). It has wide side notches at the base and a median ridge on both surfaces. Figure 14 is the lower end of a straight-based blade; figures 15 and 16, probably scraper fragments, are slightly concave at the base and notched above. On Plate VIII, figures 17 to 20, 23, are shown five of the triangular blades that were so characteristic of T 1. Figures 17, 18, and 23 have one edge dulled by chipping and the opposite edge with a flake removed; in figures 19 and 20 one edge is dulled and the opposite edge is sharp from the original flake. Figure 21 is a broken scraper with flaring lower end; figure 22 is a thick narrow implement resembling a chisel or drill, carefully worked along the edges and lower end. The only "burin-like" implement found at T 3 was the unfinished specimen shown in figure 26. The spall (figure 27) was struck from one of these implements and retains parts of the rubbed edges. Three other spall implements are shown on Plate VIII, figures 28 to 30. Figure 24 is a flake with heavy retouch along all edges, and figure 31 is a natural flake, produced by frost or heat action, with the edges lightly retouched. Two cut sections of purple clam shell and the rim sherd of a soapstone vessel are shown in figures 25, 32, and 33.

Micro-blades from T 3 (Plate IX, figures 1-20) were the same types as found at T 1, including those with carefully prepared tangs for hafting (figures 16-19). Various kinds of backed blades, with one edge blunted by chipping or thickened by removal of a longitudinal flake, are illustrated on Plate IX, figures 21 to 30. One of the blades (figure 26) has a prominent side notch.

## T 2 Site

This is a small Dorset site covered by 8 to 12 inches of wind-blown sand on the same old beach ridge, the second up from the sea, on which the Sadlermiut site is located (Plate III A). In 1954 two 5-foot squares (called Test Pit 10) were partially excavated, and in 1955 the cut was extended to include a third square; another small test cut (No. 16) was also dug close to No. 10. A few Sadlermiut artifacts and fresh-looking animal bones occurred sporadically in the sand layer overlying the Dorset occupation level. The latter was a well-defined black stratum averaging 6 inches thick, the upper 2 to 3 inches of which was an old sod layer. The Dorset stratum contained an abundance of flint chips; large numbers of bird and mammal bones, and a small number of artifacts (Plate X); the animal bones and the bone and ivory artifacts were all weathered and patinated.

Plate X, figure 1 is a slender knife-handle like those frequently found at Dorset sites. The side blade socket is 5.2 cm. long, 3 mm. wide, and 4 mm. deep. Two other handles of the same general type were found at this site in 1954 (Collins, n.d., Plate IV, figures 1, 2). The much more extensive excavations at T 1 revealed no examples of this typical Dorset knife-handle. However, one of the T 3 handles (Plate VII, figure 25) has the same kind of socket and opposite lashing groove as the T 2 example. The bone object shown on Plate X, figure 2 may be an unfinished harpoon head with two line holes—another Dorset type missing at T 1 and T 3. If it was a harpoon head, it was lost or discarded before the socket had been cut or the upper end



completed. Figure 4 is a badly weathered dart point with three small barbs. Figure 5 is the end of an ivory sled shoe. It resembles the one from T 3 (Plate VII, figure 1) in being rounded on the under surface and flat on the upper surface (shown) and in having a large lashing slot cut through from side to side. The end, however, is cut off at a slant rather than notched. The broken needle (Plate X, figure 6), the only one found at T 2, differs from those at T 1 and T 3 in having an eye that was not countersunk and an upper end that was rounded instead of pointed. Figure 7 is a realistic carving of a loon with a finely incised chevron design on the back and short straight lines on the neck. The two feet are carved separately, and through the tail is a narrow slot. Figure 9 is a small soapstone vessel sherd with a thickness of only 2 mm. Although flint chips and flakes occurred in great profusion, there were few finished artifacts, none of them similar to those from the other two sites. Only one micro-blade, and a rather poor one, was found at T 3 (Plate X, figure 12). Figure 10 is a modified micro-blade with the outer surface extensively worked. Figure 3 is a thick triangular flake, entirely unworked. Figure 13, an asymmetric knife blade, is the third example of this typical Dorset artifact to come from this small site (Collins, n.d., Plate VII, figures 44, 45). The type was not found at T 1 or T 3. Figure 8 has the outline of a scraper, but the edge is thin and sharp; it may be part of an ovoid knife blade or side blade. Plate X, figure 15 is a large harpoon or lance blade with the characteristic Dorset concave base. It and the three large knife blades (figures 11, 14, 16) were found lying together with four other blades of similar size but of various shapes.

The small collection of artifacts from T 2 contains several highly characteristic Dorset types that were not found at T 1 (knife-handles with long, deep side sockets, ivory sled shoes with ends fitted together, asymmetric knife-blades, harpoon or lance blades with deeply concave base, and possibly the small harpoon head with two line holes—the unfinished specimen shown on Plate X, figure 2). Two harpoon heads found at T 2 in 1954 (Collins, n.d., Plate III, figure 19) were of the late Dorset type from which the modern Sadlermiut form developed. The T 2 site thus fits more closely into the classic Dorset pattern than does T 1. It is closer culturally to the late Dorset site on Mill Island excavated by O'Bryan (1953) than to T 1 or T 3. This fact and its lower elevation above sea-level would indicate that it is considerably younger than T 1, which, as we have seen, might be described as developmental or proto-Dorset.

### Walrus Island

On June 19 a Peterhead boat came from Coral Harbour to take us to the west end of Coats Island to search for Dorset sites. We left the next day, going by way of Walrus Island to examine some stone house ruins reported by Manning (1942). We assumed the ruins were Sadlermiut, but when preliminary digging revealed Dorset artifacts we decided to stay longer and test the possibility of the houses being Dorset. As subsequent work pointed to this conclusion, we stayed on Walrus Island until July 25 instead of going on to Coats Island.

The six house ruins, in addition to a number of stone enclosures, lay in a valley extending east and west across the south end of the island. This was the only place on the island where the soil and sod were deep enough

for constructing underground dwellings; the rest of the island was bare granite with vegetation restricted mainly to crevices and at the base of rock ledges. The houses were 100 yards from the sea on the east side and 300 yards on the west at an estimated height of 50 feet above sea-level. They were made entirely of granite boulders (Plate III, B) some of them massive. In some cases natural granite ledges and huge boulders had been incorporated into the house structure to serve as parts of flooring, walls, or sleeping platforms. Most of the houses were deep, and all had entrance passages; the latter were from 5 to 10 feet long and faced east, southeast, east-southeast and south-southwest. In one of the houses (No. 4) the floor was a natural rock ledge, around and above which rose walls of large boulders and slabs placed one above the other and backed up by an embankment of sods on the outside. The houses varied considerably in shape and structure. The three oldest looking houses (Nos. 1, 3, and 5) consisted of a single room; the more recent looking ones had two rooms (No. 4) and three rooms (Nos. 2 and 6). One of the three-room houses (No. 6) had the clover-leaf shape, the other (No. 2) was more irregular in outline. In general, the rooms were oval to rectangular. House No. 6 had roof supports consisting of massive stone slabs set upright, and fallen slabs indicated that the roof itself had been made of stones, like the Sadlermiut houses we had excavated in 1954 on Coats Island. In the other houses, no stone roofing slabs were found, leading to the supposition that the roofs had been of skin.

The three single room houses (Nos. 1, 3, and 5) were filled in and appeared much older than the better preserved houses Nos. 2, 4, and 6. G. W. Rowley and P. D. Baird, members of the British-Canadian Arctic Expedition of 1936, had excavated in some of these houses, and T. H. Manning, leader of the Expedition, reported that a few Dorset artifacts were found among many others that resembled Sadlermiut (Manning, 1942, p. 28). From this it would appear that some of the houses had been occupied by Sadlermiut, perhaps secondarily; and the best preserved house (No. 6) was typically Sadlermiut in appearance and might well have been built by these Eskimos. Our own excavations produced over 100 clearly recognizable Dorset artifacts and large numbers of flakes with retouched edges that had been used for cutting or scraping as at T 1 which probably were Dorset. We found ten artifacts that were clearly non-Dorset, including one diagnostic Sadlermiut arrow point and the tip of what seems to have been a wooden arrow shaft, both from House 4. The eight other non-Dorset artifacts were small pieces of bone and ivory, unidentifiable as to function, containing drilled holes, and a second arrow shaft tip. All of these came from House 2, though the bulk of the material from this house was Dorset. Houses 1, 3, and 5 yielded only Dorset material, though little digging was done in the last two. Most of our excavations were made in Houses 1, 2, and 4, in a midden in front of House 1, and in a rock crevice and on a sod-covered rock ledge adjacent to House 2. A few artifacts were excavated from House 5 and in and around House 3. The large stone-roofed, clover-leaf-shaped house (No. 6) was not excavated, and no artifacts were found in or around it.

Representative implements from the Walrus Island houses and middens are illustrated on Plates XI to XIII. Animal bones and artifacts of bone and ivory, except as noted hereafter, were deeply patinated, as at



Dorset sites generally. Bird and mammal bones were far less abundant than at the Native Point sites. Flint flakes and chips were found in abundance only in House 1 and in the rock crevices and ledge adjacent to House 2, though the little digging we did at House 3 indicated they were equally abundant there. As at most Dorset sites, the materials used were hard varieties of rock including chert, chalcedony, and some nephrite; however, relatively few of the implements were made of the grey chert so characteristic of Native Point.

The bone and ivory implements were few and rather nondescript in appearance. The two ivory objects shown on Plate XI, figures 1 and 3, are of uncertain function. Figure 1 tapers to a thin wedge-like upper end; figure 3 is a thin triangular piece of ivory with a deep groove, at the bottom of which is a small slot. Figure 2 seems to be an unfinished harpoon head, and figure 4 the lower end of an ivory knife or scraper with a deeply counter-sunk suspension hole. Figures 5 and 6 are flaking tools—light hammers—made of walrus maxillary or mandible, similar to those from T 1. The broken ivory object shown in figure 7 is probably the base of a lance or projectile of some kind; on the upper surface (shown) there is a wide, shallow lashing groove and on the opposite side a shallow rounded socket. The small harpoon shown on Plate XI, figure 8 is one of the Sadlermiut pieces. It has a round, closed socket, a divided spur, and a line hole parallel with the spur; it is flat on the opposite side and has no blade slit. It is well preserved and fresh looking, a creamy yellow in contrast to the chocolate brown of the other ivory objects. Figure 9, a pointed ivory object with flat left edge, is of the same colour, and its cultural attribution is doubtful. Figure 10 is part of a large knife or lance with long, narrow sockets for side blades. The upper end is broken and retains the base of a transverse slit for an end blade; the lower end has been cut off. The under surface is deeply eroded, and the colour of the ivory is a light brown. Drilled holes at the ends of one of the side sockets place this implement in the Sadlermiut category. The form, too, is typically Sadlermiut, a side-bladed knife or lance such as Wissler (1918, pp. 121, 123) has described and such as we found at the Sadlermiut site at Native Point. It is a type, however, which I believe originated in the Dorset culture. The wedge-shaped scarified wooden objects (figures 11 and 12) are probably the ends of arrow shafts; they are almost certainly of Sadlermiut origin as they fit the similarly scarified and bevelled lower ends of Sadlermiut bone arrowheads. The two remaining objects shown on Plate XI, figures 13 and 14 cannot be definitely allocated to either the Dorset or Sadlermiut occupation. Figure 13 is a worked section of small walrus tusk, and figure 14 is a bird bone, cut at the left end.

The end blades illustrated on Plate XII, figures 1 to 4 are closely similar in form to those from T 1, and figure 1 is made of the grey Native Point chert. The upper end has a sharp median ridge, and the opposite side is rounded and carefully worked. Figures 3 and 4 are worked in the same manner. Figure 2 is a slender delicate blade, from which a spall 1.5 cm. long has been detached by a burin blow from the base. Figure 5 is the tip of a thick heavy blade, the opposite side of which has a median ridge and is entirely unworked. Thin side blades of various shapes are shown in figures 6 to 12. Figures 11 and 12 are fragments of long straight-edged side blades such as were found at T 1, and both are made of the

grey Native Point chert. Figure 13 is the mid-section of either an end or side blade. One complete blade and two broken ones of unusual form are shown on Plate XII, figures 16, 18, and 20. They seem to be end blades for either knives or lances, with straight bases, high side notches, and pointed ends; figure 19 is somewhat similar in shape. The bases of two blades with low side notches are shown in figures 21 and 22; the latter is a T 1 type and is made of the grey Native Point chert. Figure 23 is a small rubbing stone made of shale.

Two complete and two broken end-scrapers are shown on Plate XIII, figures 1 to 4. Figure 5 is an unusual type of knife blade, made from a primary flake. The outer surface consists of the cortex of the original pebble or core, unmodified except at the upper end, which has been sharpened by chipping. The bulbar surface (shown), with bulb of percussion at lower end, has the edges carefully trimmed and the lower end constricted to form a haft. Forty-five complete or broken micro-blades (lamellar flakes) were found in and around the houses, and of these 19 were of Native Point chert. Several pieces of worked rock crystal were also found. Figure 6 is a thin jadeite blade with a sharp bevelled cutting edge at the lower end. Various forms of Dorset implements with rubbed edges and sides are shown in figures 7 to 10. Figures 7 to 9 are the types usually found at Dorset sites, whereas figure 10 is the specialized tanged form so characteristic of T 1; it is not, however, made of Native Point chert. Figure 11 is a rectangular section of one of these implements, with both edges rubbed. Figure 12 is a heavy curved flake, pointed at the upper end and worked on the outer surface. Three of the spall implements (figures 14-16) are similar to those from T 1, and the ends are worn from use. Figure 14 was struck from one of the implements with rubbed edges; the outer surface and both edges are rubbed. Figure 13 is a larger, heavier spall made in the same manner, with both edges and the top rubbed and the outer surface rubbed and chipped. Four triangular microliths like those from T 1 and T 3 are shown on Plate XIII, figures 17 to 20. All have one edge dulled by chipping, but figures 17, 18, and 20 differ from most of the Native Point implements in having the opposite edge sharp by removal of an oblique flake. Figure 19 has been converted into a burin by removal of several short spalls from the upper right edge. Figures 18 to 20 are made from Native Point chert, and figures 17 and 19 have a fine retouch along the base. Figure 21 is a thick chisel-like implement. Figures 22 to 27 are flakes of various kinds with retouched edges used for cutting or scraping, improvised implements comparable to those found in great numbers at T 1.

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## PLATE I

- A. View of the 70-foot-high plateau at Native Point, Southampton Island, on which the proto-Dorset site T1 is located. Looking inland, to the south.
- B. Excavations at House 30, Sadlermiut site, Native Point.





A



B

## PLATE II

- A. Beginning excavations at T3, an old beach line 25 feet lower than T1 plateau in background.
- B. Excavations at T3 site, Native Point.



A



B



## PLATE III

- A. Test pit 10 at T2 site, Native Point. Marker rests on black soil of the Dorset occupation level.
- B. Hous : 2, one of six stone house-ruins on Walrus Island, 30 miles off coast of Southampton Island.



A



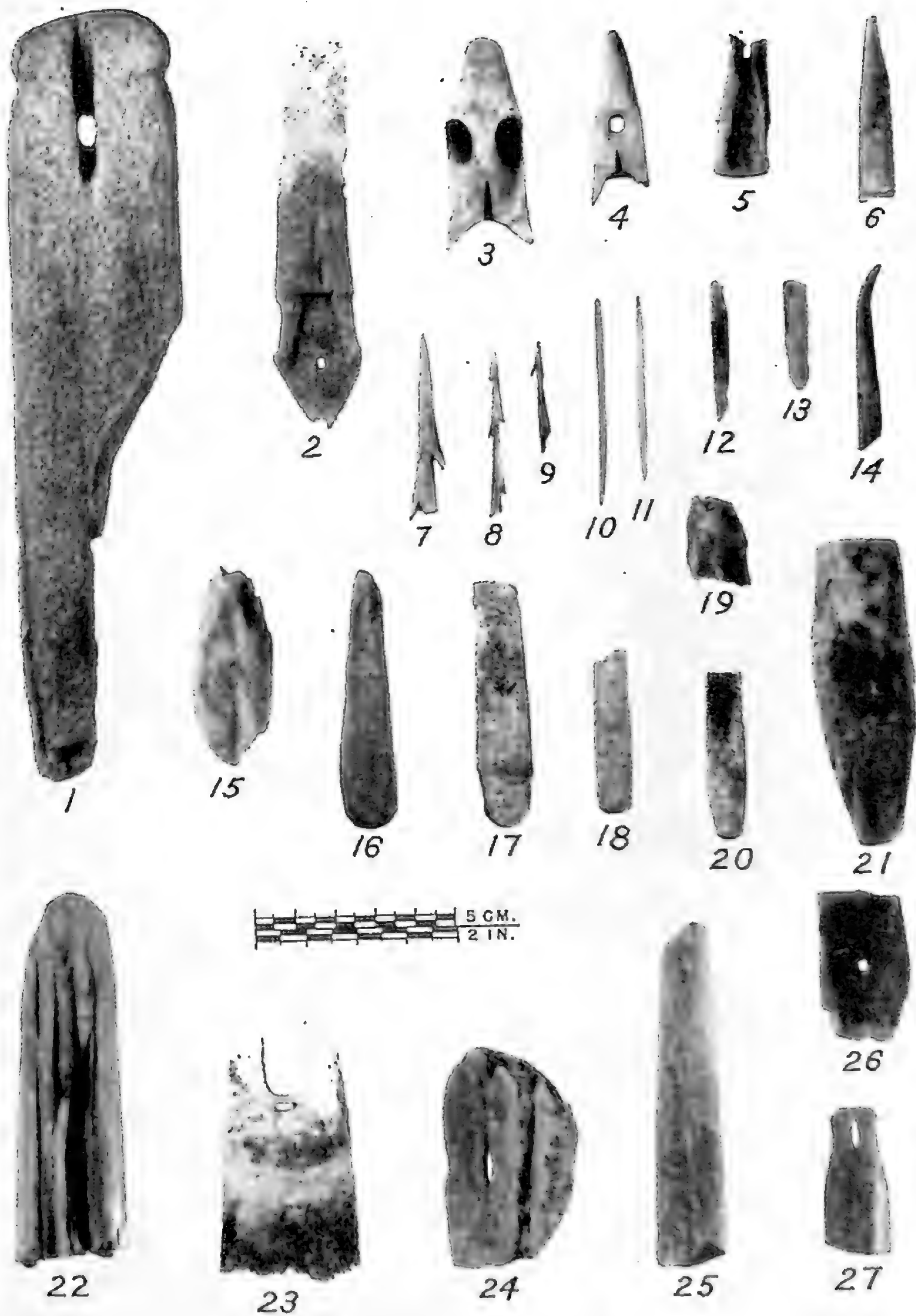
B

## PLATE IV

(½ natural size)

Figure 1. Whalebone sled shoe	T1, Trench A, square 5, level 3
Figure 2. Lance head, ivory	T1, Surface, west side
Figure 3. Harpoon head, ivory	T1, Trench A, square 8, level 1
Figure 4. Harpoon head, ivory	T1, Midden 5, square 1, level 1
Figure 5. Base of harpoon head, ivory	T1, Trench A, square 1, level 2
Figure 6. Upper end of harpoon foreshaft, ivory	T1, Trench A, square 9, level 1
Figure 7. Tip of barbed point, ivory	T1, Trench A, square 12, level 2
Figure 8. Tip of barbed point, ivory	T1, Trench A, square 4, level 2
Figure 9. Tip of barbed point, ivory	T1, Trench A, square 5, level 2
Figure 10. Bone needle	T1, Trench A, square 10, level 1
Figure 11. Bone needle	T1, Trench A, square 8, level 1
Figure 12. Piece of composite knife handle, ivory	T1, Trench A, square 5, level 2
Figure 13. Toy lance-head, ivory	T1, Midden 5, square 1, level 2
Figure 14. Ivory object	T1, Midden 5, square 1, level 1
Figure 15. Tip of lance-head, ivory	T1, Trench A, square 9, level 2
Figure 16. Flaking hammer, walrus bone	T1, Midden 5, square 1, level 1
Figure 17. Flaking hammer, walrus bone	T1, Trench A, square 12, level 2
Figure 18. Flaking hammer, walrus bone	T1, Midden 5, square 1, level 2
Figure 19. Piece of needle-case, ivory	T1, Midden 5, square 1, level 1
Figure 20. Flaking hammer, walrus bone	T1, Trench A, square 12, level 2
Figure 21. Flaking hammer, walrus bone	T1, Midden 5, square 1, level 2
Figure 22. Piece of worked walrus tusk	T1, Midden 5, square 1, level 3
Figure 23. Carving of polar bear heads, ivory	T1, Surface, west side
Figure 24. Bone object	T1, Trench A, square 5, level 2
Figure 25. Ivory knife, broken	T1, Trench A, square 4, level 1
Figure 26. Ivory object	T1, Trench A, square 4, level 1
Figure 27. End of ivory knife	T1, Trench A, square 10, level 1

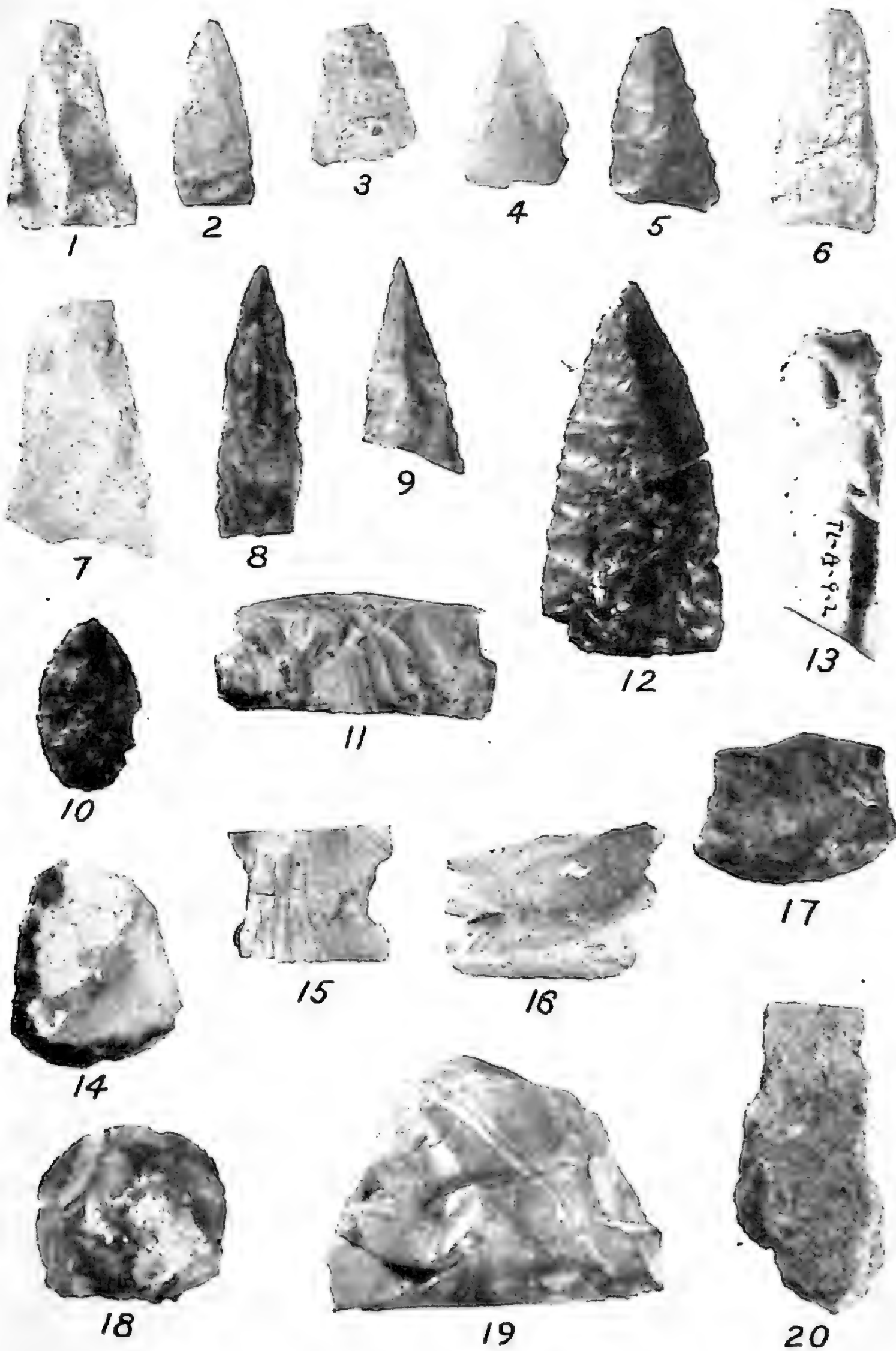




## PLATE V

(natural size)

Figure 1. Projectile point	T1, Trench A, square 5, level 1
Figure 2. Projectile point	T1, Trench A, square 5, level 3
Figure 3. Projectile point	T1, Trench A, square 5, level 3
Figure 4. Projectile point	T1, Trench A, square 1, level 1
Figure 5. Projectile point	T1, Trench A, square 5, level 3
Figure 6. Projectile point	T1, Trench A, square 4, level 2
Figure 7. Projectile point	T1, Trench A, square 9, level 1
Figure 8. Projectile point	T1, Trench A, square 9, level 2
Figure 9. Projectile point	T1, Midden 5, square 1, level 2
Figure 10. Side blade	T1, Trench A, square 5, level 3
Figure 11. Blade tang	T1, Trench A, square 1, level 2
Figure 12. Knife or lance blade	T1, Trench A, square 1, level 2
Figure 13. Side blade	T1, Trench A, square 9, level 2
Figure 14. Scraper	T1, Trench A, square 1, level 1
Figure 15. Blade tang	T1, Trench A, square 1, level 2
Figure 16. Blade tang	T1, Trench A, square 5, level 2
Figure 17. Scraper	T1, Trench A, square 1, level 2
Figure 18. Chert flake, used as knife or scraper	T1, Trench A, square 4, level 1
Figure 19. Unfinished adz-like scraper	T1, Trench A, square 5, level 3
Figure 20. Soapstone pot fragment	T1, Trench A, square 5, level 2

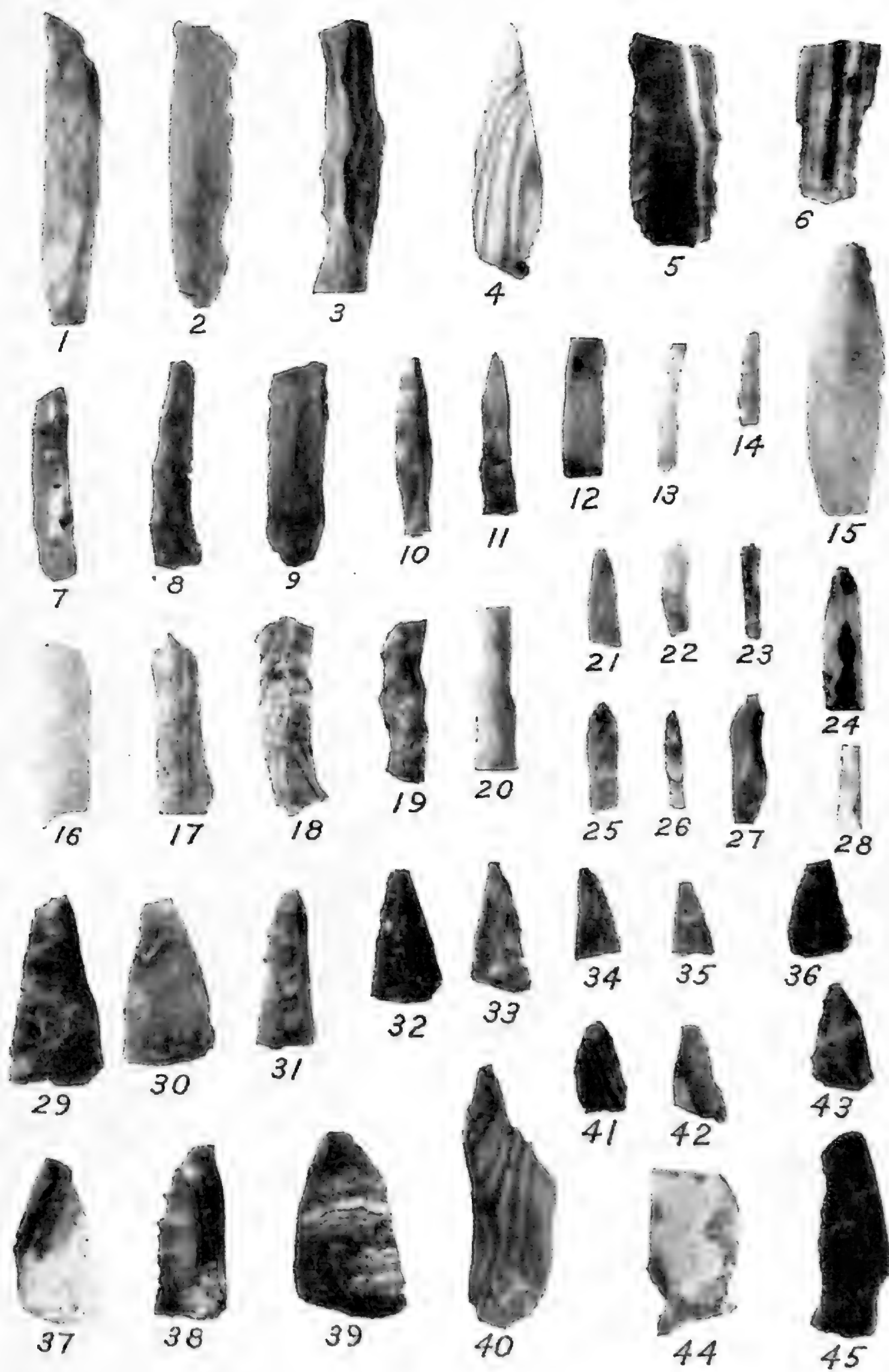




## PLATE VI

(natural size)

Figure 1. Micro-blade	T1, Midden 5, square 1, level 3
Figure 2. Micro-blade	T1, Midden 5, square 1, level 2
Figure 3. Micro-blade	T1, Trench A, square 4, level 1
Figure 4. Micro-blade	T1, Trench A, square 9, level 2
Figure 5. Heavy chert flake	T1, Trench A, square 4, level 1
Figure 6. Micro-blade, tanged	T1, Trench A, square 9, level 2
Figure 7. Micro-blade, tanged	T1, Midden 5, square 1, level 2
Figure 8. Micro-blade, tanged	T1, Trench A, square 5, level 3
Figure 9. Micro-blade, tanged	T1, Trench A, square 1, level 2
Figure 10. Micro-blade, tanged	T1, Midden 5, square 1, level 3
Figure 11. Micro-blade, tanged	T1, Trench A, square 1, level 2
Figure 12. Micro-blade, tanged	T1, Midden 5, surface
Figure 13. Micro-blade, tanged	T1, Midden 5, square 1, level 3
Figure 14. Micro-blade, tanged	T1, Trench A, square 12, level 2
Figure 15. Micro-blade, tanged	T1, Midden 5, surface
Figure 16. Backed blade	T1, Midden 5, surface
Figure 17. Backed blade	T1, Trench A, square 4, level 1
Figure 18. Backed blade	T1, Trench A, square 4, level 1
Figure 19. Backed blade	T1, Midden 5, square 1, level 2
Figure 20. Thick flake	T1, Midden 5, surface
Figure 21. Chert spall	T1, Trench A, square 5, level 2
Figure 22. Chert spall	T1, Trench A, square 8, level 1
Figure 23. Chert spall	T1, Trench A, square 9, level 2
Figure 24. Chert spall	T1, Midden 5, square 1, level 1
Figure 25. Chert spall	T1, Midden 5, surface
Figure 26. Chert spall	T1, Trench A, square 5, level 1
Figure 27. Chert spall	T1, Trench A, square 1, level 2
Figure 28. Chert spall	T1, Trench A, square 5, level 2
Figure 29. Triangular microlith	T1, Trench A, square 4, level 1
Figure 30. Triangular microlith	T1, Trench A, square 9, level 1
Figure 31. Triangular microlith	T1, Midden 5, square 1, level 2
Figure 32. Triangular microlith	T1, Trench A, square 5, level 3
Figure 33. Triangular microlith	T1, Midden 5, square 1, level 2
Figure 34. Triangular microlith	T1, Trench A, square 9, level 2
Figure 35. Triangular microlith	T1, Midden 5, square 1, level 2
Figure 36. Triangular microlith	T1, Trench A, square 1, level 1
Figure 37. Triangular microlith	T1, Trench A, square 1, level 1
Figure 38. Triangular microlith	T1, Trench A, square 4, level 1
Figure 39. Triangular microlith	T1, Trench A, square 4, level 1
Figure 40. Burin	T1, Midden 4, square 4, level 1
Figure 41. Triangular microlith	T1, Midden 5, square 1, level 2
Figure 42. Triangular microlith	T1, Trench A, square 9, level 2
Figure 43. Triangular microlith	T1, Midden 5, square 1, level 2
Figure 44. Burin-like implement	T1, Trench A, square 4, level 1
Figure 45. Burin-like implement, nephrite	T1, Trench A, square 12, level 2

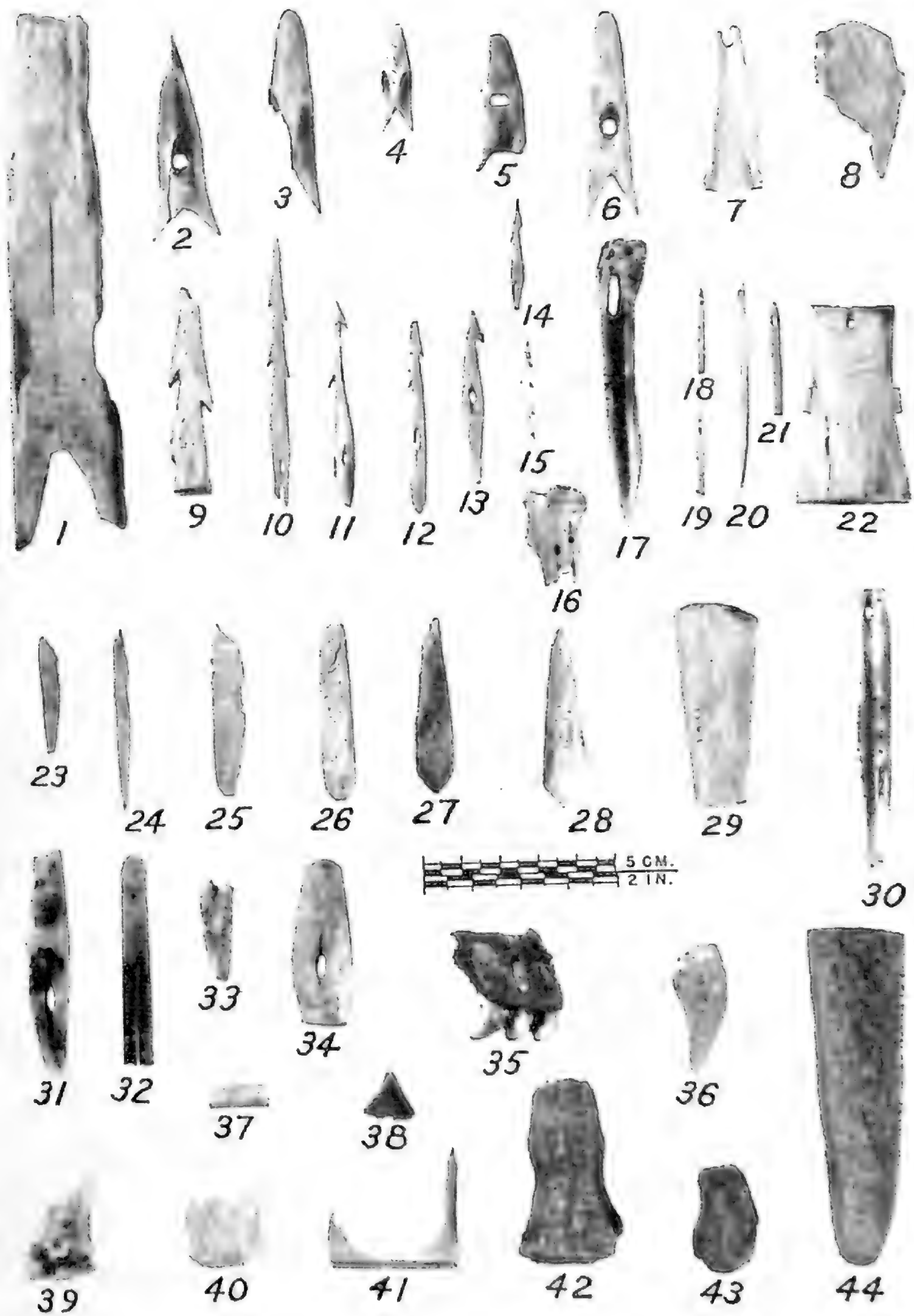


## PLATE VII

( $\frac{1}{2}$  natural size)

Figure 1. Sled shoe, ivory	T3, square 11, level 2
Figure 2. Harpoon head, ivory	T3, square 6, level 2
Figure 3. Harpoon head, ivory	T3, square 3, level 1
Figure 4. Harpoon head, ivory	T3, square 9, level 2
Figure 5. Harpoon head, ivory	T3, square 6, level 1
Figure 6. Harpoon head, ivory	T3, square 15, level 2
Figure 7. Base of harpoon head, ivory	T3, square 11, level 3
Figure 8. Base of lance-head, ivory	T3, square 6, level 2
Figure 9. Barbed dart, ivory	T3, square 6, level 1
Figure 10. Barbed dart, ivory	T3, square 12, level 2
Figure 11. Barbed dart, ivory	T3, square 9, level 2
Figure 12. Barbed dart, ivory	T3, square 11, level 2
Figure 13. Barbed dart, ivory	T3, square 13, level 2
Figure 14. Barbed dart, ivory	T3, square 15, level 2
Figure 15. Barbed dart, ivory	T3, square 1, level 2
Figure 16. Bird bone, used for making needles	T3, square 15, level 1
Figure 17. Bone awl	T3, square 1, level 2
Figure 18. Bone needle	T3, square 6, level 1
Figure 19. Bone needle	T3, square 6, level 1
Figure 20. Bone needle	T3, square 9, level 2
Figure 21. Bone needle	T3, square 9, level 2
Figure 22. Needle-case, ivory	T3, square 9, level 2
Figure 23. Piece of composite knife handle, ivory	T3, square 2, level 2
Figure 24. Piece of composite knife-handle, ivory	T3, square 6, level 1
Figure 25. Piece of composite knife-handle, ivory	T3, square 15, level 1
Figure 26. Flaking hammer, walrus bone	T3, square 11, level 3
Figure 27. Flaking hammer, walrus bone	T3, square 13, level 2
Figure 28. Flaking hammer, walrus bone	T3, square 9, level 2
Figure 29. Wedge, antler	T3, square 6, level 1
Figure 30. Spatulate knife-like implement, ivory	T3, square 6, level 1
Figure 31. Perforated implement, ivory	T3, square 9, level 2
Figure 32. Ivory implement	T3, square 9, level 2
Figure 33. Base of ivory implement	T3, square 13, level 2
Figure 34. Perforated implement, ivory	T3, square 15, level 2
Figure 35. Piece of cut polar bear maxillary	T3, square 15, level 1
Figure 36. Cut polar bear canine	T3, square 15, level 2
Figure 37. Bird bone tube	T3, square 2, level 3
Figure 38. Ivory triangle, cut from base of harpoon head	T3, square 13, level 1
Figure 39. Thin piece of worked bone	T3, square 11, level 2
Figure 40. Thin piece of worked bone	T3, square 11, level 2
Figure 41. Base of tubular antler box	T3, square 2, level 3
Figure 42. Hammer, iron pyrites	T3, square 15, level 3
Figure 43. Hammer, iron pyrites	T3, square 9, level 2
Figure 44. Rubbing tool, walrus rib	T3, square 1, level 2

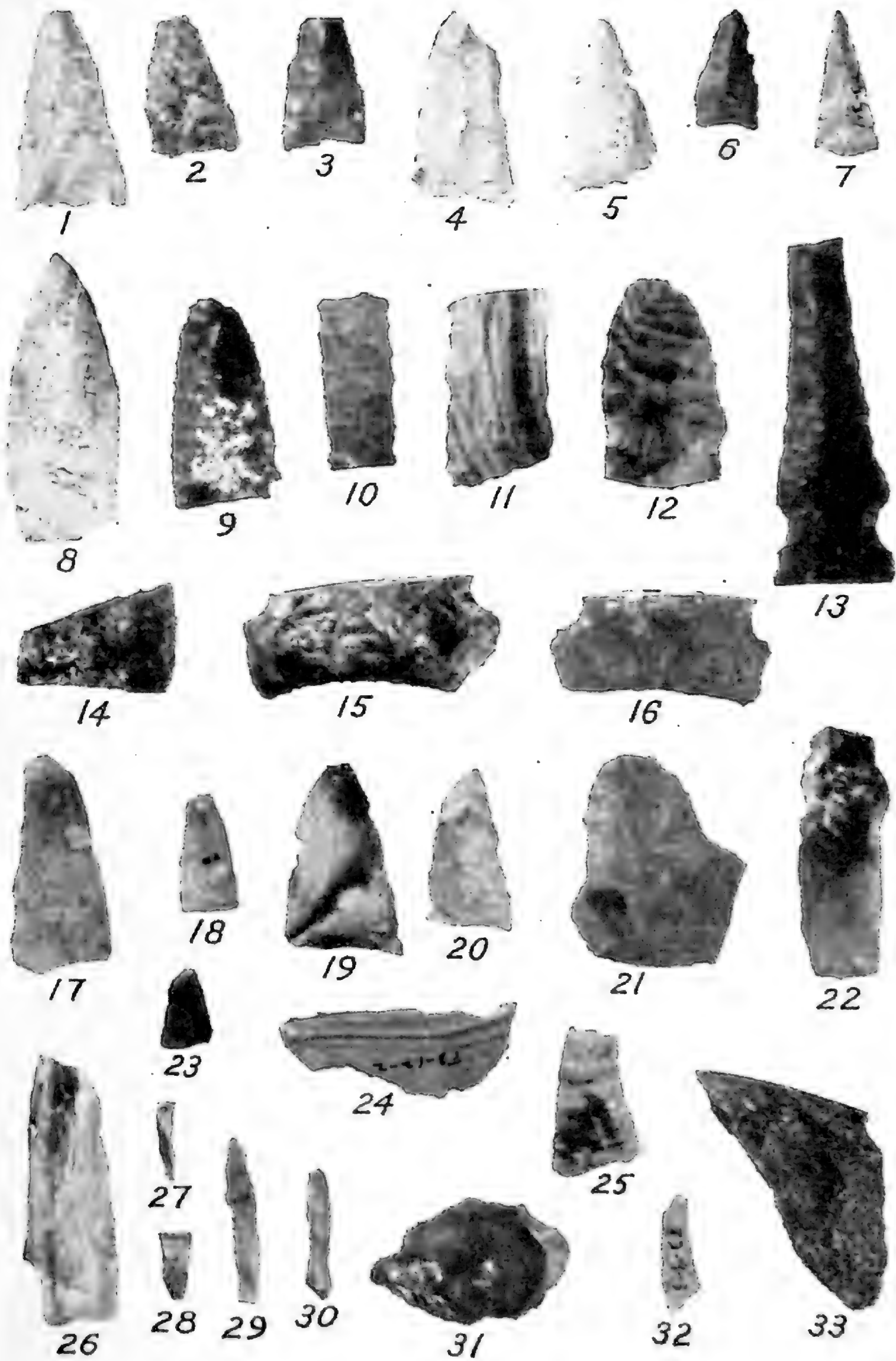




## PLATE VIII

(natural size)

Figure 1. Projectile point	T3, square 3, level 2
Figure 2. Projectile point	T3, square 11, level 1
Figure 3. Projectile point	T3, square 9, level 2
Figure 4. Projectile point	T3, square 6, level 2
Figure 5. Projectile point	T3, square 9, level 2
Figure 6. Projectile point	T3, square 15, level 2
Figure 7. Projectile point	T3, square 3, level 1
Figure 8. Projectile point	T3, square 2, level 1
Figure 9. Projectile point or knife blade	T3, square 15, level 3
Figure 10. Side blade	T3, wall between squares 9 and 13, level 2
Figure 11. Side blade	T3, wall between squares 9 and 13, level 1
Figure 12. Flake blade	T3, square 9, level 1
Figure 13. Knife blade	T3, square 9, level 2
Figure 14. Base of blade	T3, square 9, level 3
Figure 15. Base of blade	T3, square 15, level 2
Figure 16. Base of blade	T3, square 6, level 2
Figure 17. Triangular microlith	T3, square 3, level 1
Figure 18. Triangular microlith	T3, square 13, level 2
Figure 19. Triangular microlith	T3, square 15, level 2
Figure 20. Triangular microlith	T3, square 2, level 3
Figure 21. End scraper	T3, square 2, level 2
Figure 22. Chisel-shaped implement	T3, square 15, level 3
Figure 23. Triangular microlith	T3, square 6, level 2
Figure 24. Flake with retouched edges	T3, square 12, level 2
Figure 25. Cut section of purple clam shell	T3, square 9, level 2
Figure 26. Unfinished burin-like implement	T3, square 9, level 2
Figure 27. Spall implement	T3, square 13, level 1
Figure 28. Spall implement	T3, square 2, level 2
Figure 29. Spall implement	T3, square 9, level 2
Figure 30. Spall implement	T3, square 1, level 2
Figure 31. Chert flake, used as knife or scraper	T3, square 13, level 2
Figure 32. Cut section of purple clam shell	T3, square 9, level 3
Figure 33. Soapstone pot fragment	T3, square 12, level 1

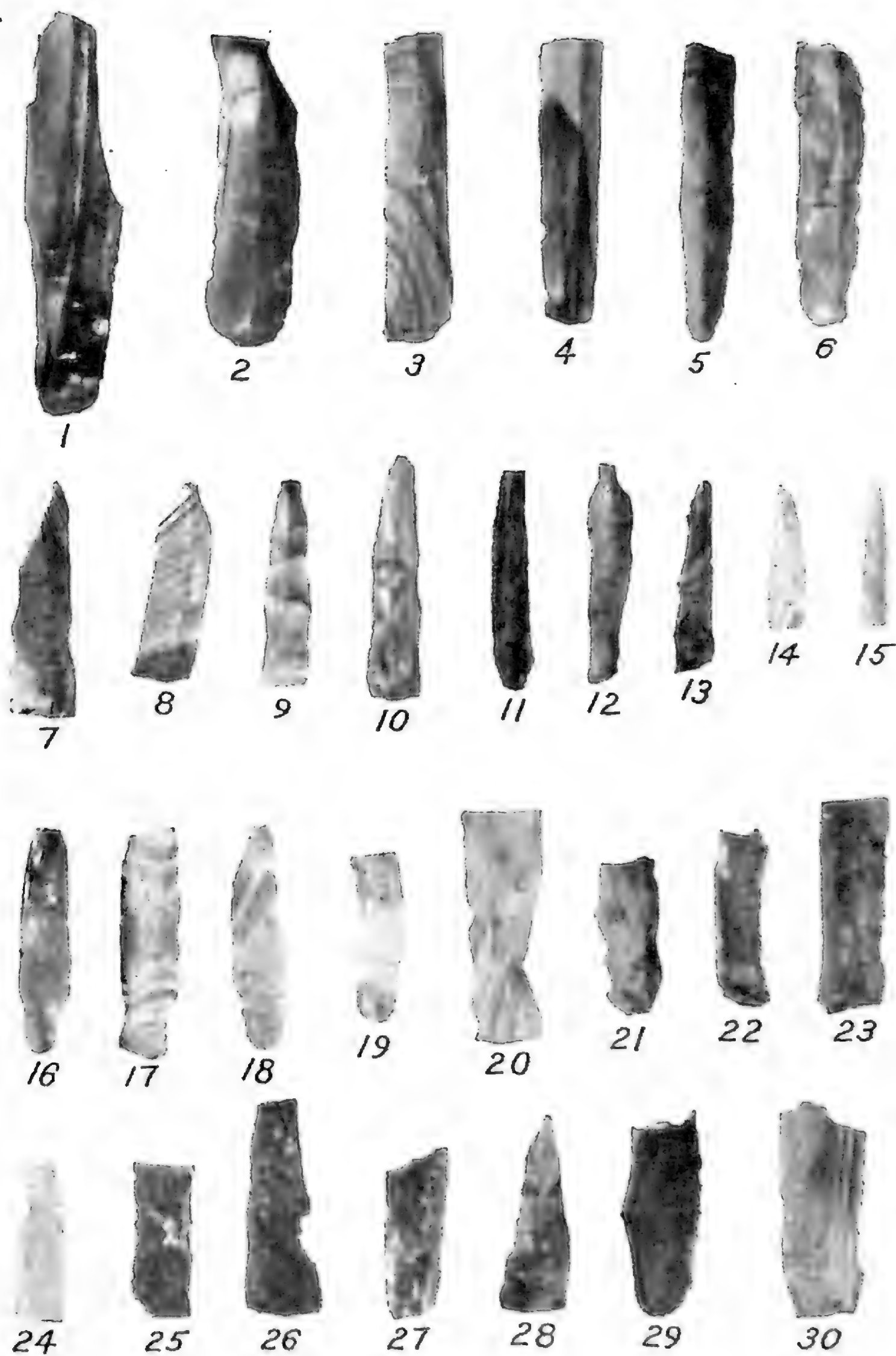




## PLATE IX

(natural size)

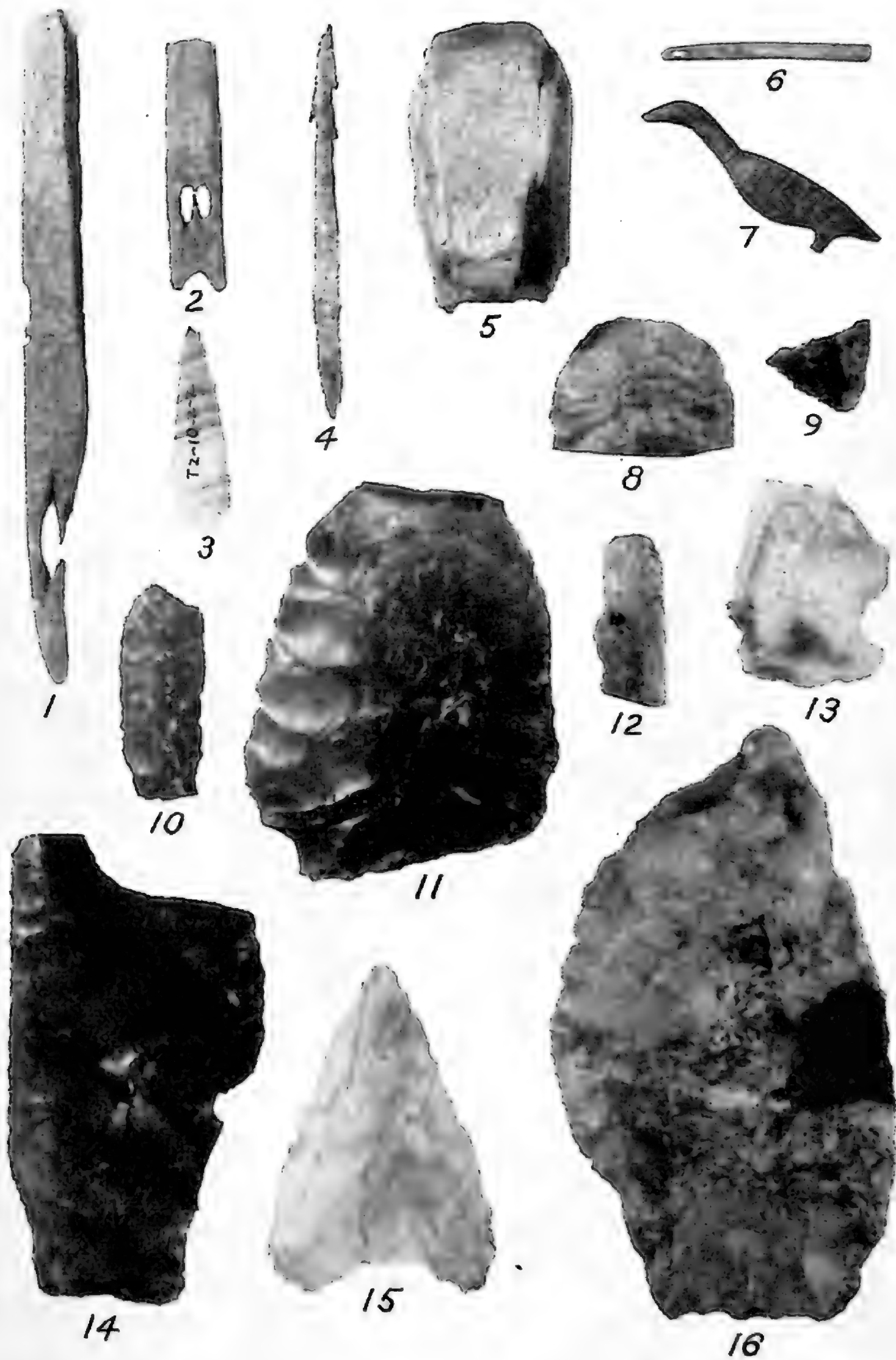
Figure 1. Micro-blade	T3, square 6, level 2
Figure 2. Micro-blade	T3, square 11, level 2
Figure 3. Micro-blade	T3, square 15, level 2
Figure 4. Micro-blade	T3, square 11, level 2
Figure 5. Micro-blade	T3, square 9, level 2
Figure 6. Micro-blade	T3, square 1, level 2
Figure 7. Micro-blade	T3, wall between squares 9 and 13, level 2
Figure 8. Micro-blade	T3, square 12, level 1
Figure 9. Micro-blade	T3, square 1, level 2
Figure 10. Micro-blade	T3, square 1, level 2
Figure 11. Micro-blade	T3, square 13, level 2
Figure 12. Micro-blade	T3, square 9, level 3
Figure 13. Micro-blade	T3, square 12, level 1
Figure 14. Micro-blade	T3, square 3, level 1
Figure 15. Micro-blade	T3, square 9, level 2
Figure 16. Micro-blade, tanged	T3, square 6, level 1
Figure 17. Micro-blade, tanged	T3, square 11, level 2
Figure 18. Micro-blade, tanged	T3, square 13, level 1
Figure 19. Micro-blade, tanged	T3, square 9, level 2
Figure 20. Micro-blade	T3, square 3, level 2
Figure 21. Backed blade	T3, square 3, level 2
Figure 22. Backed blade	T3, square 12, level 1
Figure 23. Backed blade	T3, square 9, level 2
Figure 24. Backed blade	T3, square 3, level 2
Figure 25. Backed blade	T3, square 6, level 2
Figure 26. Backed blade	T3, square 13, level 2
Figure 27. Backed blade	T3, square 9, level 3
Figure 28. Backed blade	T3, square 11, level 3
Figure 29. Backed blade	T3, square 9, level 2
Figure 30. Backed blade	T3, square 9, level 3



## PLATE X

(natural size)

Figure 1. Knife handle	T2, Test Pit 10, square 2, level 2
Figure 2. Unfinished harpoon head, bone	T2, Test Pit 10, square 2, level 2
Figure 3. Chert flake	T2, Test Pit 10, square 2, level 2
Figure 4. Barbed point, ivory	T2, Test Pit 10, square 1, level 2
Figure 5. Piece of sled shoe, ivory	T2, Test Pit 16
Figure 6. Piece of bone needle	T2, Test Pit 10, square 3, level 2
Figure 7. Carved figure of loon, ivory	T2, Test Pit 10, square 3, level 2
Figure 8. Piece of chert blade	T2, Test Pit 10, square 2, level 2
Figure 9. Soapstone pot fragment	T2, Test Pit 10, square 2, level 2
Figure 10. Knife blade	T2, Test Pit 10, square 2, level 2
Figure 11. Knife blade	T2, Test Pit 10, square 3, level 2
Figure 12. Micro-blade	T2, Test Pit 16
Figure 13. Asymmetric knife blade	T2, Test Pit 10, square 2, level 2
Figure 14. Knife blade	T2, Test Pit 10, square 3, level 2
Figure 15. Harpoon or lance blade	T2, Test Pit 10, square 3, level 2
Figure 16. Knife blade	T2, Test Pit 10, square 3, level 2





## PLATE XI

(natural size)

- |  |                                    |
|--|------------------------------------|
| Figure 1. Ivory object                                     | Walrus Island, House 2, floor      |
| Figure 2. Unfinished harpoon head, ivory                   | Walrus Island, House 1, midden     |
| Figure 3. Ivory object                                     | Walrus Island, House 1, midden     |
| Figure 4. Lower end of ivory knife                         | Walrus Island, House 2, floor      |
| Figure 5. Flaking hammer, walrus bone                      | Walrus Island, House 2, north room |
| Figure 6. Flaking hammer, walrus bone                      | Walrus Island, House 1, south side |
| Figure 7. Base of harpoon (?), ivory                       | Walrus Island, House 2, floor      |
| Figure 8. Sadlermiut harpoon head, ivory                   | Walrus Island, House 2, north room |
| Figure 9. Ivory object                                     | Walrus Island, House 2, east wall  |
| Figure 10. Knife or lance head with side sockets,<br>ivory | Walrus Island, House 2, north room |
| Figure 11. Tip of arrow shaft, wood                        | Walrus Island, House 4, floor      |
| Figure 12. Tip of arrow shaft, wood                        | Walrus Island, House 2, floor      |
| Figure 13. Piece of worked ivory                           | Walrus Island, House 5             |
| Figure 14. Piece of worked bird bone                       | Walrus Island, House 4             |



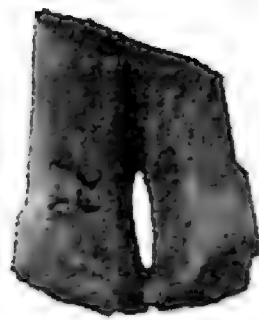
1



2



3



4



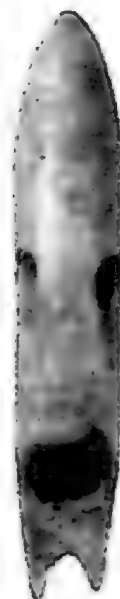
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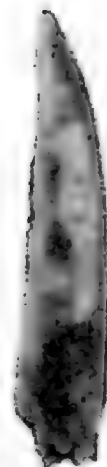
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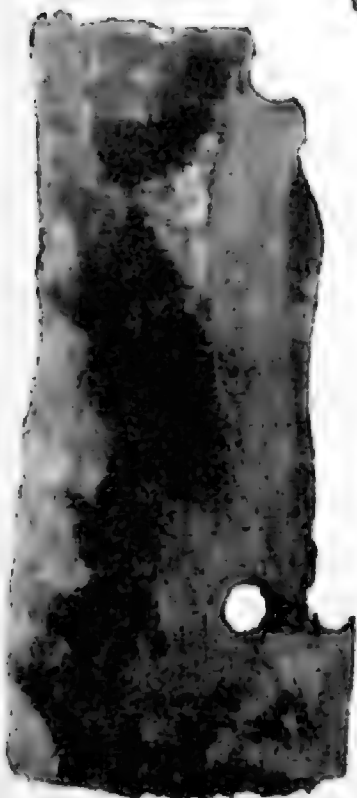
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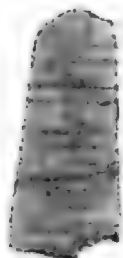
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11



12



13

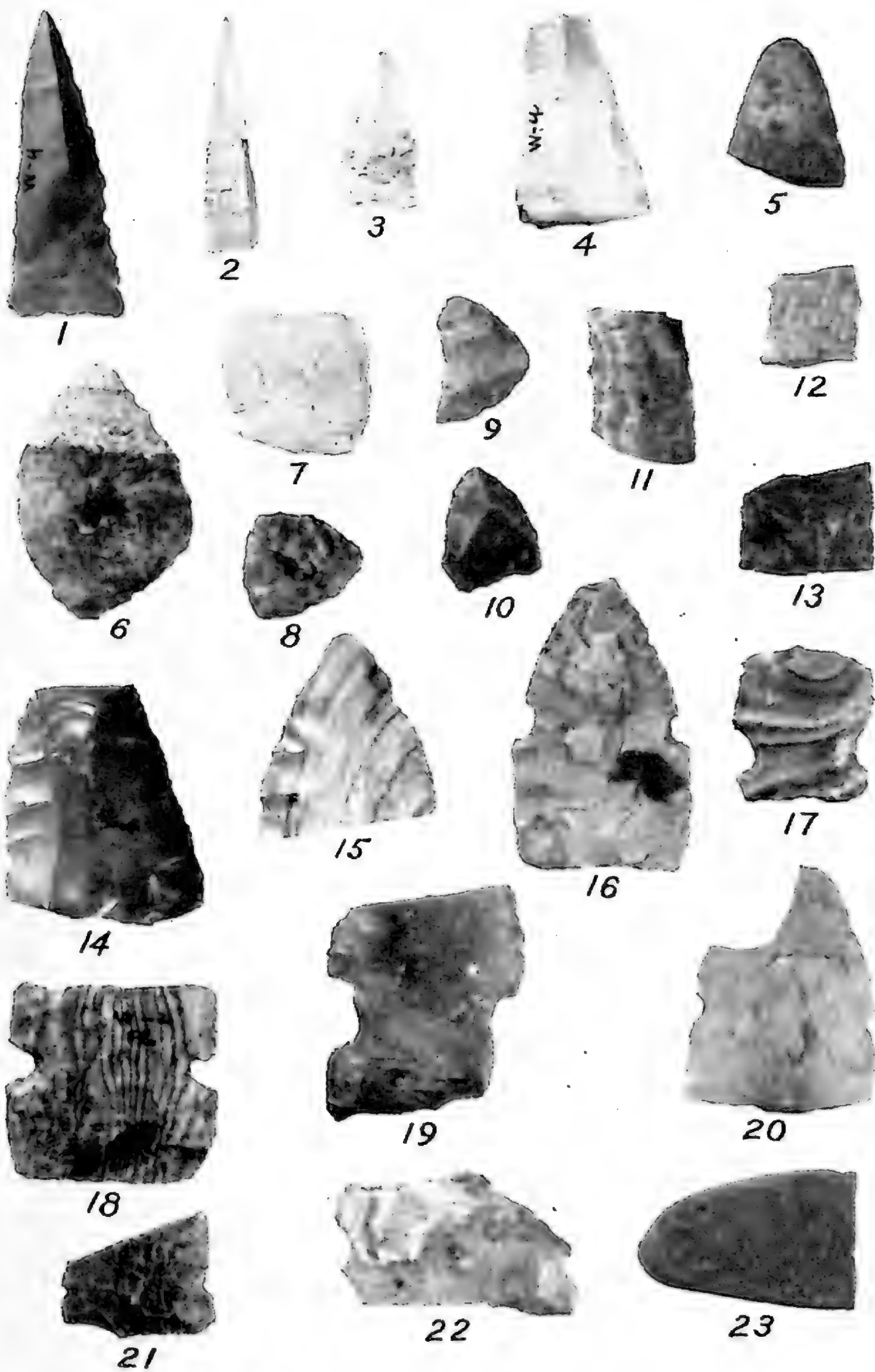


14

## PLATE XII

(natural size)

Figure 1. Projectile point	Walrus Island, House 4
Figure 2. Projectile point	Walrus Island, Rock ledge
Figure 3. Projectile point	Walrus Island, Rock ledge
Figure 4. Projectile point	Walrus Island, House 4
Figure 5. Blade tip	Walrus Island, House 4
Figure 6. Side blade	Walrus Island, Rock ledge
Figure 7. Side blade	Walrus Island, Rock ledge
Figure 8. Side blade	Walrus Island, House 2, east wall
Figure 9. Side blade	Walrus Island, House 2, east wall
Figure 10. Side blade	Walrus Island, House 2, floor
Figure 11. Side blade	Walrus Island, House 4
Figure 12. Side blade	Walrus Island, House 3
Figure 13. Blade fragment	Walrus Island, House 2, floor
Figure 14. Blade	Walrus Island, House 4
Figure 15. Blade tip	Walrus Island, House 1, midden
Figure 16. Knife or lance blade	Walrus Island, House 2, floor
Figure 17. Broken knife blade or scraper	Walrus Island, House 3
Figure 18. Broken knife or lance blade	Walrus Island, House 2, floor
Figure 19. Broken knife or lance blade	Walrus Island, House 3
Figure 20. Broken knife or lance blade	Walrus Island, House 2, north room
Figure 21. Blade fragment	Walrus Island, Rock ledge
Figure 22. Base of blade	Walrus Island, Rock ledge
Figure 23. Rubbing stone, shale	Walrus Island, House 1, east side

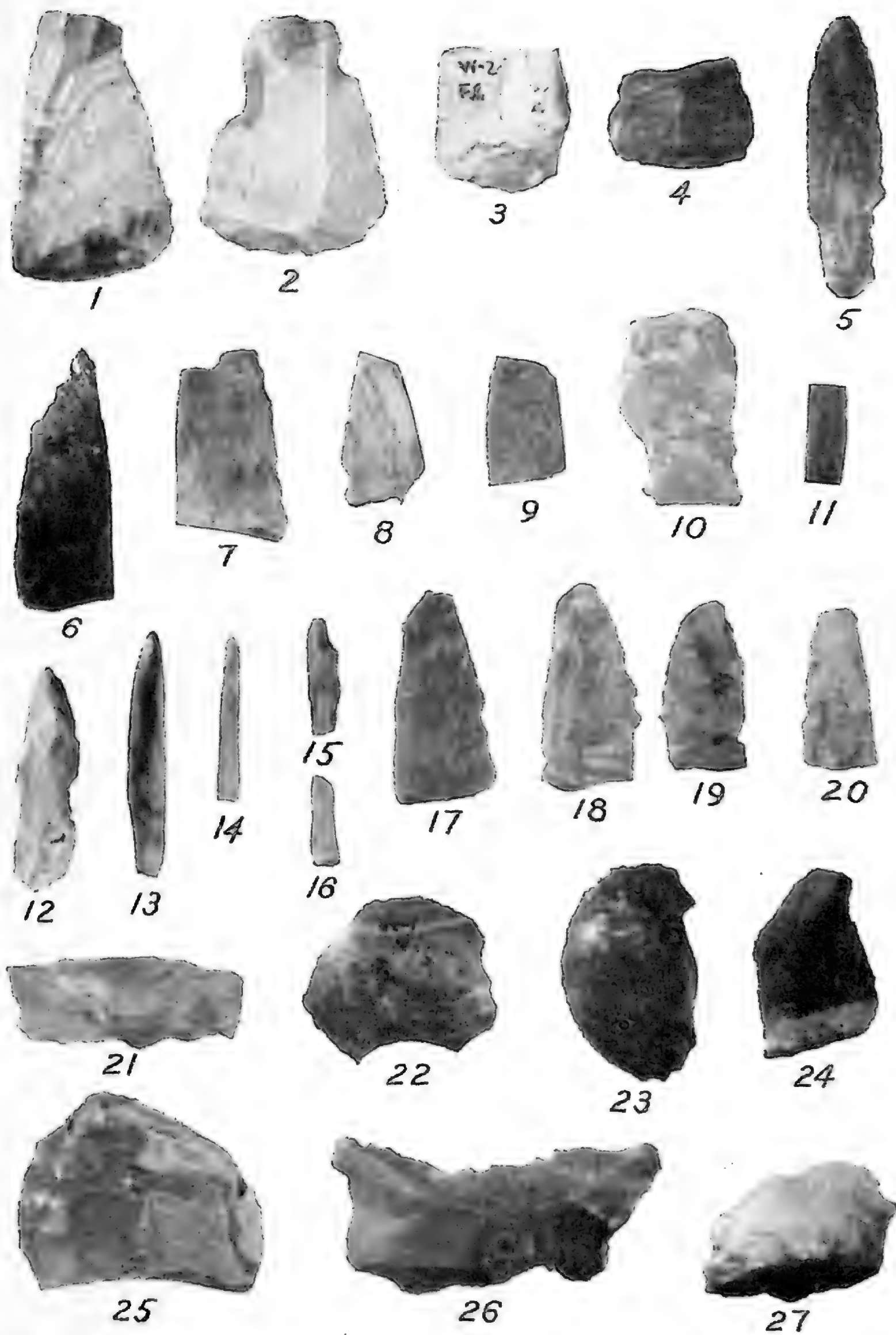




## PLATE XIII

(natural size)

Figure 1. End scraper	Walrus Island, House 2, floor
Figure 2. End scraper	Walrus Island, Rock ledge
Figure 3. End scraper	Walrus Island, House 2, floor
Figure 4. End scraper	Walrus Island, House 5
Figure 5. Knife blade	Walrus Island, House 2, floor
Figure 6. Adz blade fragment, jadeite	Walrus Island, House 2, north room
Figure 7. Burin-like implement	Walrus Island, House 2, floor
Figure 8. Burin-like implement, nephrite	Walrus Island, Rock ledge
Figure 9. Burin-like implement	Walrus Island, Rock crevice
Figure 10. Burin-like implement	Walrus Island, House 2, east wall
Figure 11. Burin-like implement, fragment	Walrus Island, Rock ledge
Figure 12. Heavy flake implement	Walrus Island, House 2, east wall
Figure 13. Spall implement	Walrus Island, House 3
Figure 14. Spall implement	Walrus Island, Rock crevice
Figure 15. Spall implement	Walrus Island, Rock crevice
Figure 16. Spall implement	Walrus Island, Rock ledge
Figure 17. Triangular microlith	Walrus Island, House 4
Figure 18. Triangular microlith	Walrus Island, House 1, south side
Figure 19. Triangular microlith	Walrus Island, House 1, midden
Figure 20. Triangular microlith	Walrus Island, House 2, floor
Figure 21. Chisel-shaped implement	Walrus Island, House 2, floor
Figure 22. Flake, used for cutting or scraping	Walrus Island, House 1, north side
Figure 23. Flake, used for cutting or scraping	Walrus Island, House 1, south side
Figure 24. Flake, used for cutting or scraping	Walrus Island, House 1, north side
Figure 25. Flake, used for cutting or scraping	Walrus Island, House 2, north room
Figure 26. Flake, used for cutting or scraping	Walrus Island, House 1, south side
Figure 27. Flake, used for cutting or scraping	Walrus Island, House 1, south side



## RAPPORT PRÉLIMINAIRE DE L'ÉTUDE SUR LA CULTURE ACADIENNE DU NOUVEAU-BRUNSWICK

*par Marcel Rioux*

L'étude ethnographique des processus culturels sous-jacents à l'évolution du Canada français contemporain doit inclure, de toute évidence, non seulement le Québec mais aussi les groupes minoritaires des autres provinces. Le plus homogène et le plus nombreux de ces groupes est sans contredit celui des Acadiens et plus particulièrement ceux du Nouveau-Brunswick. A cause de sa situation géographique et historique, la région de Moncton fut choisie comme premier objet d'enquête dans cette province.

Pour étudier cette minorité ethnique ou du moins certains aspects dynamiques de sa vie contemporaine, on pouvait choisir de traiter cette population comme un simple prolongement culturel du Québec et rapporter le comportement des individus aux modèles et aux normes de cette entité culturelle, considérée comme une sorte de matrice dont les groupes minoritaires ne seraient que la reproduction. Cette façon de procéder aurait postulé implicitement une très grande homogénéité culturelle entre le Québec et les minorités francophones du reste du Canada. C'est d'ailleurs l'opinion de tous ceux qui, regardant la mosaïque canadienne à vol d'oiseau, concluent, en partant de la similitude linguistique entre le Québec et la minorité acadienne du Nouveau-Brunswick, à l'identité culturelle. Dès nos premiers contacts avec la réalité acadienne, cette présupposition fut mise en doute et il devint de plus en plus évident, à mesure que l'enquête se poursuivait, qu'on ne pouvait pas se servir du modèle de la société québécoise pour l'étude de cette population et qu'il fallait construire un modèle<sup>1</sup> de la société acadienne pour avoir chance de la comprendre. Dans les études classiques de l'ethnographie, ce modèle est construit en procédant à une coupe synchronique de la réalité socio-culturelle; ce modèle est ensuite considéré comme celui d'une société donnée dont on postule implicitement l'équilibre à travers le temps. Dans l'étude de la minorité acadienne, il nous apparut qu'il serait profitable d'essayer de pratiquer une coupe diachronique et de nous rendre compte de la formation de certains modèles idéaux qui nous permettraient d'étudier non seulement des relations de dépendance fonctionnelle mais encore, en y introduisant le point de vue génétique, des relations de dépendance causale. Cette démarche semble se justifier non seulement du point de vue de l'étude de la minorité acadienne mais encore du point de vue de la société québécoise. En effet, en suivant l'évolution de la minorité acadienne, ne pourrait-on pas y trouver des processus et des stades qui, bien que différents de ceux du Québec, pourraient nous éclairer sur des stades antérieurs de cette entité culturelle? Il ne semble pas faire de doute qu'au niveau de l'idéologie il y ait bien des traits communs entre les deux groupes ethniques.

<sup>1</sup>Ici, la pauvreté de l'appareil conceptuel de l'anthropologie culturelle se fait sentir; le même mot "modèle" désigne, dans la terminologie en usage, deux choses distinctes: d'une part, modèle désigne un mode de comportement prescrit par une culture donnée; d'autre part, modèle signifie la représentation symbolique de l'inter-action de certains phénomènes socio-culturels que l'anthropologiste construit et qu'il applique à l'interprétation de ce qui se passe empiriquement. Le contexte nous éclairera sur le sens qu'il convient de retenir.

L'Université Saint-Joseph a gracieusement mis à notre disposition la documentation rassemblée dans la salle dite "acadienne" de Moncton et nous a permis de l'utiliser. Nous nous sommes appliqué à dépouiller les livres, les journaux et les documents acadiens pour essayer de retrouver comment s'était formée ce que nous avons appelé l'idéologie acadienne. Comment, à partir surtout de la période dite de la "renaissance acadienne", s'est formée la conscience nationale des Acadiens et quels en sont les principaux éléments? Par conscience nationale, nous entendons l'idée que les Acadiens se font d'eux-mêmes, comment ils se voient comme groupe, comment ils se définissent par rapport aux autres. Cette conscience nationale apparaît comme étant largement le produit d'une certaine éducation qui avait pour but de faire prendre conscience d'eux-mêmes à un groupe d'individus dispersés sur un vaste territoire et qui ne manifestaient pas beaucoup de cohésion.

A ce stade-ci de notre travail, le modèle de cette conscience nationale n'a pas été inféré de l'étude de la culture en action mais à partir des déclarations et des écrits de toutes sortes qui ont contribué à former cette conscience nationale. Pour distinguer ces deux paliers de la réalité, nous aimerions qualifier de postulats idéologiques les idéaux qui sont inférés de l'étude de l'histoire acadienne et de sentiments idéologiques ceux qui sont internalisés et qui se retrouvent à partir de l'étude des comportements eux-mêmes. En d'autres termes, nous voulons distinguer entre l'idée qu'on voudrait que les Acadiens eussent d'eux-mêmes et l'idée qu'ils en ont réellement. À notre avis, il y a donc trois principaux paliers d'observation: les modèles purs élaborés plus ou moins consciemment par un segment de la population et qui sont censés être valables pour toute la culture acadienne; les modèles internalisés et particularisés par les sous-groupes et les différentes classes sociales; enfin, le comportement réel.

Voici une énumération partielle des principaux postulats idéologiques que nous avons cru apercevoir dans les déclarations et les écrits de ceux qui ont contribué à former la conscience nationale acadienne. (La discussion des textes d'où nous avons inféré ces postulats fera partie de notre rapport complet.)

1. *Les Acadiens forment un groupe culturel, distinct, autonome et homogène.* Il ne semble pas faire de doute que les Acadiens soient devenus très tôt un groupe culturel distinct à cause de l'isolement quasi complet dans lequel ils ont vécu depuis les débuts de la colonie. Coupés de la France et du reste des établissements français en Amérique, ils sont devenus très tôt un groupe différent dont la culture a suivi une évolution divergente de celles de la France et de la Nouvelle-France. Au moment de la Dispersion, il semble bien qu'ils formaient déjà un groupe fortement particularisé; leur histoire subséquente a favorisé la conservation de ces caractères distinctifs.

Quant à l'autonomie de la culture acadienne, il semble bien que pour les besoins de la formulation d'une doctrine nationale, ce caractère ait été exagéré et qu'on ait eu tendance à insister plutôt sur les différences que sur les éléments qui sont communs aux groupes culturels d'expression française. On ne veut pas dire que la culture acadienne n'est pas autonome dans une large mesure mais qu'au moment où une certaine élite s'est efforcée de formuler les idéaux de la conscience nationale, on a choisi d'insister sur les différences entre acadien et canadien, acadien et français.

Enfin, il est évident que l'homogénéité culturelle du groupe acadien est très grande si on la compare à d'autres groupes ethniques; il faudrait toutefois se rendre compte qu'elle n'est pas parfaite et qu'au Nouveau-Brunswick même existent des



différences appréciables entre les trois principaux centres géographiques: Edmunston, Bathurst et Moncton. Il va sans dire qu'il existe aussi une certaine hétérogénéité entre les différentes populations de chacune des provinces Maritimes. Seule une enquête sur place déterminera la nature et l'importance de ces différences.

2. *Les Acadiens sont un peuple martyr.*

*Corollaire 1:* Si ce sont les Anglais dont ils aient le plus à se plaindre, ils ne peuvent pas non plus se fier aux autres groupes.

*Corollaire 2:* Le salut ne leur viendra que s'ils savent s'unir et présenter un front commun.

3. *La foi catholique et la langue française sont très intimement liées.* La perte de l'une entraîne la perte de l'autre et vice versa. Ces deux éléments sont, d'autre part, liés à l'existence de la nation acadienne: "Serrons de plus en plus nos rangs au pied des autels et n'oublions jamais que le jour où, infidèles à nos serments, nous trahirons notre foi, nous cesserons d'exister comme nation." (Poirier, Pascal, "Le Père Lefebvre et l'Acadie" 1898, p. 110, en note.)

4. *Nos adversaires veulent nous faire passer pour un peuple inférieur; dans bien des domaines nous leur sommes supérieurs.* C'est ainsi que souvent les archaïsmes de la langue acadienne sont donnés comme une preuve de la supériorité de cette langue sur d'autres qui en sont dépourvues.

A partir des postulats de cette idéologie que nous avons inférés à partir des déclarations et des écrits de personnalités et d'auteurs acadiens, nous avons voulu savoir comment ils sont internalisés et vécus par les différents sous-groupes et classes sociales. Ce travail formera la matière d'une monographie à venir.

## RAPPORT DE L'ENQUÊTE LINGUISTIQUE FAITE À CAP-PELÉ (NOUVEAU-BRUNSWICK)<sup>1</sup>

par Gaston Dulong

L'enquête que j'ai faite à Cap-Pelé a été extrêmement fructueuse. Un dépouillement complet de cette enquête, qui cependant est loin d'être exhaustive, comprend plus de 1,200 fiches ayant trait à la *morphologie*, à la *phonétique*, à la *syntaxe*, au *vocabulaire*. Il va sans dire que les fiches du vocabulaire sont les plus nombreuses; environ 1,000 dont plus de 200 anglicismes.

La *morphologie* de la langue parlée à Cap-Pelé est nettement archaïque et a trait surtout à des formes verbales. A titre indicatif, voici quelques participes passés "réguliers" de verbes irréguliers en français commun: vi (vécu), mouri (mort), teindu (teint), déteindu (déteint).

Voici les principales caractéristiques de la *phonétique* de la langue parlée à Cap-Pelé.

Presque tous les substantifs se terminant en français commun par *-oir* se prononcent encore en *oué* comme au 16<sup>e</sup> siècle. Voici quelques exemples: abrevoir, dévidoir, battoir, jouquoir (juchoir), vannoir.

Plusieurs verbes en *-ir* en français commun se prononcent *-zir*: Amolzir, blêmezir, embellezir, enlaidzir, laidzir, rajeunezir, vieilliezir . . .

Survivance dans un grand nombre de mots de l'ancien son français *dj* dans anguille, baguette, bagueuler, diable, guêpe, guette, guipon, guiponner, guerre, langueur devenant andjille, badjette, etc.

Survivance également de l'ancien son français *tch* dans cuit, écume, matière, moitié, piquet, quai, qui, raquette, ponchon, qui sont prononcés tchuit, étchume, matchére, etc . . .

Le *vocabulaire* de Cap-Pelé est formé de mots archaïques ou dialectaux, ainsi que d'emprunts aux langues indienne (micmac) ou anglaise. Voici quelques *mots d'origine indienne*:

Maskoui: écorce de bouleau.

Nigoguer: darder un poisson avec un nigog.

Nigog: espèce de dard ou de foëne pour darder le poisson.

Mocauque: terrain bas et marécageux, savane.

Pour montrer la grande richesse de cette langue en mots archaïques ou dialectaux, signalons:

Abrie: abri.

Barge: meule de foin.

Ambouri: nombril.

Beluette: étincelle.

Pilot: tas.

Bouchure: clôture.

Baganière: fente de jupe.

Bouillée: touffe d'arbres.

Baillarge: orge.

Bourgau: sifflet, sirène.

<sup>1</sup>Cette enquête a été entreprise dans le cadre de celle de Marcel Rioux dont le rapport préliminaire précède celle-ci.

Bronnes: mamelles de truie.	Longis: lent.
Cagouette: nuque.	Maite: pétrin.
Chacoter: couper avec un canif.	Métiver: couper à la faucille.
Chancre: crabe.	Mitan: milieu.
Courge: joug.	Néasse: veau d'un an.
Déconforté: découragé.	Oriote: hart.
Détrier: sevrer un veau.	Par les petits: peu à peu.
Drapeau: langes.	Piroune: oie femelle.
Drosses: criblures.	Plaise: plie.
Échaleau: ridelle.	En premier: autrefois.
Éguiber: vider le poisson.	Remeuil: pis de vache.
Élan: moment.	Ringer: ruminer.
Éloise: éclair accompagné de tonnerre.	Rouli: banc de neige.
Émoyer, s': s'informer.	Île Saint-Jean: Île du Prince-Édouard.
Éparer: étendre.	Subler: siffler.
Esherber: sarcler.	Taiser, se: se taire.
Fayot: haricot.	Tet à cochon: porcherie.
Galance: balançoire.	Torteau: pâtisserie.
Gibars: gestes.	Trompe: guimbarde.
Haim: hameçon.	Usse: sourcil.
Hucher: appeler quelqu'un.	Varne: aune.
Laiche: aiche.	Lait veriou: colostrum.
	Zire: dédain.

L'étude de l'anglicisme dans un centre comme Cap-Pelé où la pression linguistique anglaise est très forte et où presque tous les gens sont bilingues est très révélatrice et réserve des surprises. Par exemple, comment se fait-il que ce que partout dans la province de Québec on appelle *tong* et *neck-yoke* ait conservé des appellations françaises à Cap-Pelé: aiguille et joug? Les mots anglais empruntés donnent naissance à des dérivés dont voici des exemples:

Crab: "pommette".	Frolic: partie de plaisir.
Crabier: "pommettier".	Froliquer: danser, s'amuser.
Feed: moulée.	Putty: mastic.
Feeder: donner de la feed aux animaux.	Putteyer: mastiquer.

L'anglicisme affecte toutes les parties du vocabulaire, même celles que l'on croirait les mieux protégées. Le *Glossaire acadien* de Pascal Poirier ne laisse pas soupçonner la place importante de l'anglicisme dans la langue acadienne et bien des éducateurs ne semblent pas se rendre compte du problème.

La *syntaxe* de la langue parlée à Cap-Pelé est aussi intéressante. La possession se marque encore par la préposition à comme dans: la maison à Un 'Tel. *Mais que* s'emploie au sens de lorsque. Les accords des verbes sont souvent parfaits, ce qui est très rare dans la langue parlée même en France. Même chose pour la concordance des temps. On dira toujours *il fallait que ça arrivât*, jamais *que ça arrive*.

## LES JEUX EN GASPÉSIE

*par Carmen Roy*

L'un des contrastes les plus frappants que présente la vie en Gaspésie est celui de la gaieté turbulente des soirées d'amusements et du silence lourd de tous ces soirs nostalgiques où, dans l'obscurité des cuisines, la vie ne semble plus s'exprimer que dans le mouvement las d'un bras qui soulève le rideau de mousseline, à la recherche d'un flâneur qui pourrait inspirer quelques sujets de commérages. Mais il serait erroné de s'imaginer alors que, dans un tel milieu, ne s'épanouit plus la franche gaieté; pour se convaincre du contraire, il n'est que de s'attarder dans les rues par un soir de "fricot", de "tire", de carnaval ou de noces, dans ces villages subitement réveillés et brusquement tapageurs. Nous avons d'ailleurs nous-même craint tant de fois voir céder les parquets que l'animosité du jeu ou les rixes de minuit menaçaient de faire ouvrir, que nous ne doutons plus de l'entrain qu'apporte la population au jeu.

Déduire du fait que les gaspésiens ne se sont jamais adonnés au sport—si ce n'est depuis une quinzaine d'années, dans quelques paroisses seulement—le goût qu'ils éprouvaient de "jouer dur", nous semble un peu trop simpliste, car ils avaient amplement de quoi canaliser leurs forces et énergies dans leurs travaux. Il reste cependant que ces jeux se sont montrés une très bonne initiation à la gymnastique, méconnue de la population. Si l'ignorance des sports a pu marquer quelque influence sur eux, ce serait plutôt en les privant de l'esprit sportif propre à l'Anglo-Saxon, par exemple. Comme le "fair play" ne limitait pas les règles du jeu, il va de soi que la loi de la force, exprimée tant par la brutalité, la trivialité que le ridicule, avait tôt fait de se gagner des adeptes. D'autre part, retenue par un niveau de culture très élémentaire, la population n'a pu que donner aux jeux un caractère rustre, inspiré par la plus ou moins grande originalité des individus. De plus, les jeux s'étant prêtés aux désirs qu'on avait de confondre un copain ont si vite outrepassé leurs limites que, dans la moitié des cas, ils ont été remplacés par la farce appelée "tour".

Aussi a-t-on su choisir les cadres qui supporteraient rixes et querelles. C'est ainsi que ceux qui possédaient de vastes cuisines sont devenus les hôtes attitrés de ces soirées d'amusements. Pour mieux comprendre la qualité effective des jeux, il faut remarquer qu'ils ont toujours été considérés comme jeux d'intérieur, envers et contre les dégâts que pouvaient causer l'eau, les vitres cassées ou les chaises brisées.

Les jeux se divisent en trois grandes catégories: les jeux d'hommes, les jeux mixtes et les jeux d'enfants. Chez les premiers, les jeux de souplesse, d'habileté et de force perdent peu à peu l'attrait qui les caractérisait il y a une trentaine d'années. Ils se pratiquent encore, occasionnellement,—même dans les paroisses les plus évoluées,—mais de façon générale, nos enquêtes nous ont révélé que seuls les bûcherons les gardaient au premier



plan dans l'organisation de leurs loisirs. Si, de leur côté, les jeux mixtes perdent aussi de leur popularité, les jeux d'enfants, par contre, se multiplient sous l'influence des institutrices qui les collectionnent et les répandent.

Mais alors que ces derniers se retrouvent sensiblement identiques autour de la péninsule gaspésienne, les jeux d'adultes ont été parfois, d'un secteur à l'autre, modifiés dans leur exécution ou renouvelés dans leur originalité. Ici on ajoutera un dialogue à l'action (comparer "Où êtes-vous, Jacques?" et le "Jeu de l'ours"), là on exigera plus d'efforts (comparer le "chien blanc" au "jeu des animaux") à la faveur d'astuces nouvelles. Ces modifications ont-elles été opérées en Gaspésie ou apportées par des bûcherons voyageurs? Nos enquêtes n'ont pas encore été assez exhaustives pour que nous puissions répondre à cette question.

D'autres cas se sont aussi présentés où seuls les noms des jeux ont été changés d'un endroit à l'autre; par exemple, "Abattre le jib", à la Rivière-au-Renard, devient le "Cheval branlant" dans la région de la baie des Chaleurs; le "Torchon", à Cap-Chat, devient la "Rate" à la Rivière-au-Renard, et la "Savate" dans la région de la baie des Chaleurs; "Cache 'tit potte", à Cap-Chat, devient "Cache la belle bergère" aux environs de Rivière-au-Renard et "Cache ma bague" dans la baie des Chaleurs.

Mais toutes les variantes, même lorsqu'elles deviennent, dans certains cas, des versions nouvelles, conservent aux jeux en général le caractère que nous avons plus haut décrit. Nous ne pourrions dire des jeux, comme nous l'avons déjà fait au sujet des contes populaires, que leur aire de distribution en Gaspésie soit révélatrice d'un comportement propre à un comté plutôt qu'à un autre.

## A. JEUX D'HOMMES

### 1. Cochon, cochonnette:

Deux joueurs tiennent chacun l'extrémité d'une corde fixée au centre par un clou. Chacun a une lanière de cuir en main. L'un des joueurs crie: "Cochon, cochonnette", et se recule aussitôt pour éviter le coup de lanière commandé par le cri. Et c'est ainsi que d'un coup plaisant à l'autre, les joueurs prennent de l'entrain et finissent par désirer se heurter le plus possible. Le nombre de coups réglementaires est généralement outrepassé.

### 2. Jeu de cordonnier:

Deux joueurs, face à face, sont assis sur le parquet, les pieds attachés avec une corde et les mains liées sous un manche de balai retenu par deux copains. On se pique, à tour de rôle, avec une fourchette.

### 3. Où êtes-vous, Jacques?

Deux joueurs, les yeux bandés, sont assis sur le parquet, ayant en mains chacun un bas dans lequel on a placé un peloton de laine. Le joueur qui désire vaincre son adversaire doit réussir, avec son arme, à le frapper trois fois de suite.

### 4. Jouer à l'ours:

(Variante du jeu précédent recueillie à Saint-Siméon, Bonaventure.)

Deux joueurs, les yeux bandés, accroupis comme des ours, sont attachés l'un en face de l'autre au moyen d'une corde qu'on leur passe autour du cou.

Chacun des deux joueurs a en mains un bas de laine dont le pied est rempli de matières plus ou moins dures. On s'aborde en ces termes :

—Jack, how are you?

—I am in the dark.

—Take that before I'll die.

Et l'on se frappe ainsi à tour de rôle jusqu'à ce que le vainqueur pousse son adversaire à demander grâce.

#### 5. Tirer au renard :

Deux joueurs sont accroupis, l'un en face de l'autre, à une couple de pieds de distance. On leur attache le cou ensemble avec une longue écharpe. Et le jeu commence. C'est à qui réussira à faire avancer son adversaire dans sa direction. Chacun n'a que la force de son cou pour attirer vers lui son compagnon. Le jeu ne se termine que lorsque le vainqueur a réussi à entraîner son adversaire jusqu'au mur.

#### 6. Lever au raide :

Un joueur est par terre, étendu sur le dos. Il plie ses genoux, puis durcit ses muscles. Un autre joueur passe ses deux bras sous les genoux du précédent et tente de le replacer sur ses deux pieds.

#### 7. Charger le mort :

Un joueur, étendu sur le parquet, fait le mort relâchant tous ses muscles. Un autre joueur tente de le charger sur son épaule. Il n'y arrive pas sans difficultés car le mort est lourd et s'efforce, en simulant l'inertie, d'augmenter les difficultés de son adversaire.

#### 8. Charger le mouton :

Contrairement au jeu précédent, le mouton a la vie. Mais il s'agit de le charger quand même sur son épaule, alors qu'il se débat pour rendre la tâche plus difficile.

#### 9. Lever au balai :

Deux joueurs sont assis par terre, pieds contre pieds. Ils tiennent un balai, au bout de leurs bras, dans une position horizontale. Au signal donné, s'appuyant sur les pieds l'un de l'autre, ils tentent de ramener le balai chacun vers soi. Le plus fort réussit à lever son compagnon.

#### 10. Tirer de la jambette :

Couchés tête-bêche sur le parquet, deux joueurs croisent leurs chevilles droites l'une contre l'autre pendant que leurs jambes gauches sont repliées au genou et que leurs pieds sont bien appuyés contre terre. Lorsque le meneur du jeu donne le signal, chaque joueur tente, par la seule force de sa jambe droite, de renverser son adversaire.

#### 11. Arracher la souche :

Un joueur est penché, les deux mains appuyées sur une chaise, la tête en direction du mur. Il symbolise la souche. Un autre joueur est assis à

califourchon sur son dos, la tête en direction contraire, les deux jambes passées sous ses bras. Ce dernier tente d'arracher la souche, ce qui nécessite beaucoup de force.

## 12. Le cheval fendu :

Un joueur est penché, les deux mains appuyées sur une chaise. Bien solidement campé dans cette position, il doit recevoir sur son dos tous les autres joueurs qui, les uns par-dessus les autres, vont tenter de l'enfourcher. Pour le premier qui saute, il n'est pas de difficultés, mais à mesure que les joueurs se succèdent, le saut devient de plus en plus hardi. Aussi n'est-il permis à personne de se déplacer ou de se replacer en équilibre sur le dos de son compagnon si, d'emblée, il n'a pas sauté aussi d'aplomb qu'il l'aurait voulu. C'est pourquoi il arrive souvent qu'un joueur perde son équilibre et tombe sur le parquet. Le jeu recommence alors et c'est le vaincu qui doit se placer en dessous. Si personne ne tombe, le jeu est fini.

## 13. Monter le baril :

Un petit baril est dressé contre un mur. On demande à un joueur s'il peut, de ses deux talons, faire monter, en lui donnant un élan, le baril jusqu'à la hauteur de ses jarrets. Tous ceux qui ne connaissent pas le jeu se font fort de pouvoir y arriver. Mais à peine se sont-ils lancés qu'ils vont piquer une tête par terre.

## 14. Bercer le loup-marin :

Un joueur, à genoux, mains derrière le dos, doit bercer son corps de la position horizontale à la position verticale. Il doit y aller lentement s'il ne veut baiser le parquet en l'approchant de son visage.

## 15. Peser le lard :

Deux cordes sont retenues au plafond. On les passe autour des jambes d'un joueur qui doit ainsi être suspendu à deux pieds du parquet. Il recule, recule, pendant qu'il fait marche arrière, les cordes le portent à une plus grande hauteur du sol—pour arriver enfin à aller baiser le mur. S'il n'y réussit pas, les cordes lui donnent un élan et il va s'abattre sur le parquet.

## 16. Danser le petit bonhomme :

Pour danser le petit bonhomme, un joueur s'écrase, de tout son poids sur ses jambes. Il doit ensuite avancer une jambe et l'autre, à tour de rôle, dans un mouvement cadencé. Ces mouvements chorégraphiques sont considérés en Gaspésie uniquement comme jeux de souplesse.

## 17. Tirer au poignet :

Deux joueurs appuient chacun leur coude droit sur une table, donnant à leur avant-bras une position verticale. Chacun, la main dans celle de l'autre, doit tenter, en appuyant vers la gauche, de rabattre la main de son adversaire sur la table. Lorsque les joueurs sont de force égale, la lutte est parfois longue avant que les spectateurs ne connaissent le vainqueur.

**18. Le lièvre:**

Deux joueurs sont à genoux, dos à dos. On attache le pied droit de l'un au pied gauche de l'autre, et vice versa. Puis les joueurs, à quatre pattes, font le saut du lièvre. C'est à qui entraînera l'autre sur une plus longue distance.

**19. Planter le couteau:**

Un joueur, les jambes très écartées, penché en avant, sans avoir le droit de toucher terre si ce n'est avec sa main droite, de la main gauche, doit piquer un couteau sur le parquet. C'est à qui le plantera le plus loin.

**20. Lever un homme bridé:**

Un joueur est couché à plat ventre sur le parquet. Un autre doit l'empêcher de se lever. Il passe ses deux bras sous ceux de son adversaire et croise les mains sur son cou. Chaque fois que l'adversaire fait un mouvement, il lui casse le cou.

**21. Manger la soupe:**

Placer un balai sur le parquet et une cuillère à soupe en avant du balai. Du balai à la cuillère, l'on mesure une longueur équivalente à l'avant-bras du joueur. Ce dernier s'allonge sur le parquet, ne se soutenant que de la pointe des pieds et des mains appuyées sur le balai. Il doit aller chercher la cuillère entre ses lèvres.

**22. Le tour du bâton à quatre:**

"Moi, dit un joueur, je peux lever trois hommes avec un bâton." Trois joueurs sont assis sur le parquet, côte à côte. Les deux du bord ont les jambes placées sous le bâton; celui du centre, par-dessus. Le quatrième joueur est en face et s'appuie les pieds contre ceux du joueur du centre. Puis on tire de part et d'autre, mains appuyées sur le bâton. A un moment donné, le quatrième joueur lâche le bâton et le joueur du centre culbute en arrière et fait deux ou trois tours sur lui-même.

**23. Faire voir un mort:**

On bande les yeux d'un joueur et on lui fait placer les mains derrière le dos avec promesse de lui faire voir un mort. On lui demande de crier: "Mort" (mords). Et on lui mord les doigts.

**24. Faire voir la lune:**

Faire regarder la lune dans une manche de paletot et, à ce moment, verser de l'eau par l'extrémité de la manche. Pour mieux prendre la victime au piège, on se munit de miroirs, d'outils qui laissent croire à une entreprise sérieuse.

**25. Faire boire l'éléphant:**

Deux hommes, courbés, les mains sur les genoux, sont recouverts d'une peau de carriole. On les amène boire à la fontaine, c'est-à-dire que, sous ce prétexte, on les fait avancer lentement, puis on leur lance un seau d'eau au visage.



## 26. Le cheval branlant:

Placer une longue suite d'hommes "à cheval", c'est-à-dire recourbés, ayant les mains placées sur les reins de l'un et de l'autre. Le premier a les mains appuyées sur le dossier d'une chaise. Un joueur est demandé pour enfourcher cette file de chevaux. Il tente le coup, ce pendant que tous les chevaux "branlent" pour lui rendre la tâche plus difficile. Lorsqu'après mille difficultés, il atteint enfin son but, on le précipite dans une cuve d'eau cachée derrière la chaise.

Ce jeu, recueilli à la Rivière-au-Renard, porte dans la baie des Chaleurs le nom de "Abattre le jib". Les hommes symbolisent des bateaux et tanguent à qui mieux mieux pour rendre plus âpre la course.

## 27. Les ondoyés:

Afin de prendre le plus de gens possible au piège, on s'installe dans un appartement retiré de la maison pour procéder à ce jeu. Et on invite quelqu'un à venir se faire ondoyer, sous mille et un prétextes. Or, tant par curiosité que pour connaître un jeu de plus, ou pour ne pas rompre la tradition de ces soirées auxquelles tout le monde doit se prêter de bonne grâce, on accepte.

Deux chaises sont placées à proximité l'une de l'autre dans la chambre. Mais on laisse entre chacune l'espace d'un siège. On recouvre les sièges d'une couverture que l'on tend très raide. Deux joueurs s'assoient sur chacune des deux chaises. Puis on invite le nouveau-venu à s'asseoir au centre. A ce moment-là, les deux joueurs se soulèvent légèrement et le troisième tombe dans la cuve d'eau que l'on a cachée entre les deux chaises.

## 28. L'entonnoir:

Placer un entonnoir dans la ceinture des pantalons d'un joueur. Gager avec lui qu'en lui posant un sou sur le front, il ne réussira pas à le faire tomber dans l'entonnoir.

Au moment où il renverse sa tête en arrière pour recevoir le sou sur son front, on verse le contenu d'une grande tasse d'eau dans l'entonnoir. Du coup, le joueur, choqué, ne pense plus au sou et perd sa gageure.

## 29. Magnétiser:

On demande un médium parmi l'assistance. Chacun se fait fort de pouvoir résister au magnétisme de l'opérateur et il est ainsi très facile de faire se présenter quelqu'un pour l'épreuve.

Pendant ce temps, le magnétiseur a préparé son équipement dans un appartement voisin. Deux soucoupes sont placées sur une table, les deux remplies d'eau; mais l'envers de la première est enduit de suie. Le médium arrive. Le magnétiseur lui demande de faire les mêmes gestes que lui. "Tu vas saucer tes doigts dans la soucoupe, les passer sous la soucoupe, puis te frotter le visage. Et tu vas me regarder dans les yeux." Et c'est ainsi que l'on procède dans la demi-obscurité de la chambre. Mais ce pendant que le magnétiseur passe les doigts sous une soucoupe propre, l'autre se barbouille le visage et refait ainsi son apparition devant l'assistance, après avoir reçu quelques "passes" qui n'ont pas réussi à le magnétiser.

## B. JEUX MIXTES

Si les hommes apprécient, lorsqu'ils jouent ensemble, une qualité de jeux plutôt rudes, ils savent retrouver une attitude plus calme, lorsqu'au jeu, ils s'associent à leurs compagnes. Il semble même que telle attention, qui leur apparaîtrait comme ridicule dans la vie courante, s'exprime d'une façon spontanée, voire même galante, à l'occasion de ces soirées de jeux. C'est ainsi qu'on n'a jamais connu de meilleur "mesureur de ruban" que celui qui se porte au secours d'une amie pour couper d'un baiser chacune des cinq ou dix verges de ruban qu'ils doivent feindre de mesurer au bout de leurs bras, afin de se libérer d'une punition infligée au jeu. Aussi, que de romans ne sont-ils pas nés de ces soirées qui, mieux que toute autre, favorisent les idylles et affranchissent des fausses pudeurs. Il n'est que de questionner la belle Euphémie qui vous dira: "J'cré b'en que les jeux nous ont donné une chance à moé p'is Antoine. Sans ça, on n'aurait jamais pu s'embrasser, p'is savoir comment 'ce qu'on pouvait s'aimer."

Effectivement, les jeux de société, surtout dans les "pénitences" infligées au joueur vaincu, ont consolidé les penchants que les jeunes gens et les jeunes filles éprouvaient l'un pour l'autre.

D'autre part, ils ont révélé aux uns et aux autres la nature des individus. Tel qui n'était pas bon perdant, qui était susceptible ou vindicatif au jeu, était vite reconnu comme tel. Aussi abusait-on de lui pour lui donner occasion de rejimber.

### 30. Le torchon:

(Ce jeu est ainsi appelé, à Cap-Chat et aux environs, sur une distance d'environ 100 milles; plus bas, vers Gaspé, on l'appelle "La rate"; dans la baie des Chaleurs, "La savate". Quelques détails seulement les distinguent.)

Les joueurs disposent leurs chaises en cercle, à une très faible distance les unes des autres. Un joueur est debout au centre, une serviette (appelée "torchon") ou un autre carré de tissu en main. Il lance le torchon à un des joueurs qui doit promptement le lancer à un autre des joueurs. Car si le joueur du centre réussit à se saisir du torchon ce pendant qu'un joueur l'a en sa possession, ce dernier doit le remplacer au centre. C'est pourquoi les malins, en lançant le torchon, s'efforcent autant que possible, d'entraver les genoux ou d'entortiller la tête de leur victime afin qu'elle n'ait pas le temps de se débarrasser du torchon.

### 31. La rate:

Au jeu de rate, les joueurs sont assis par terre et se servent d'un bas de laine dont le pied est rempli de guenilles. Mêmes principes quant au reste.

### 32. La savate:

Pour jouer à la savate, on se sert d'un vieux caoutchouc. Les joueurs sont assis sur le parquet, les genoux repliés. On fait circuler la savate en dessous des genoux des uns et des autres, jusqu'à ce que le joueur du centre s'en saisisse.

### 33. Souffler la chandelle:

Une chandelle allumée est placée sur la table. Un joueur, les yeux bandés, tente de la souffler et, pour y arriver, il se brûle souvent le visage pour le plus grand plaisir des spectateurs.

### 34. Cache ma bague:

Ce jeu, qui ne présente aucune distinction selon qu'il est joué dans l'une ou l'autre partie de la Gaspésie, porte cependant un nom différent ici et là. "Cache ma bague" est particulier à la région de la baie des Chaleurs; "Cache, la belle bergère", à la région sud du comté de Gaspé-Nord; et "Cache ti-potte", à Cap-Chat et aux environs. Ce jeu est généralement joué par les femmes ou les fillettes. Cependant, nous avons plusieurs fois eu l'occasion de voir les hommes s'associer à leurs compagnes.

Les joueuses, assises en rond, ont les mains collées ensemble, dans une position horizontale, de façon à recevoir un petit objet sans qu'il n'y paraisse. Une joueuse est au centre avec une bague (ou un autre petit objet) en main. A chaque joueuse elle feint de remettre la bague; finalement, elle la glisse à quelqu'une. Celle qui est chargée de deviner ne doit pas se tromper, sinon elle remet un gage et doit accomplir une pénitence pour l'affranchir<sup>1</sup>.

### 35. Les animaux:

Hommes et femmes, placés en cercle, se tiennent par la main. Un joueur est au centre, les yeux bandés, une baguette en main. Pendant que le groupe tourne, ce dernier touche quelqu'un du bout de sa baguette. On s'arrête. Le joueur du centre demande à celui qu'il a désigné d'imiter la voix de tel animal; s'il reconnaît "l'animal", ce dernier va le remplacer au centre. Sinon, on continue.

### 36. La chaise musicale:

Placer en rang, dos à dos, autant de chaises qu'il y a de joueurs actifs. Un musicien est au piano, et un maître de cérémonie à proximité. Les joueurs sont placés en avant de chaque chaise. Dès que la musique commence, ils marchent autour des chaises au rythme de la mélodie qui, pour tromper les joueurs, est tantôt lente, tantôt accélérée. Pendant ce temps, le maître de cérémonie enlève une chaise, tout à coup la musique s'arrête et les joueurs cherchent à s'asseoir. Comme il manque une chaise, le joueur le moins habile reste debout et est automatiquement éliminé du jeu. La musique reprend, on enlève encore une chaise, et ainsi de suite jusqu'à ce qu'il ne reste qu'un joueur assis, lequel est proclamé gagnant.

### 37. Le mariage trompeur:

Il faut un nombre égal de garçons et de filles. Un des groupes—par exemple celui des garçons—s'esquive dans une pièce voisine, ce pendant que les filles préparent le jeu. On range autant de chaises qu'il y a de joueurs; les filles s'entendent entre elles sur celui qu'elles choisissent comme compagnon. Puis elles s'assoient, laissant une chaise vacante entre chacune d'elles. Elles crient: "C'est prêt." Un garçon s'amène. Il est

<sup>1</sup>Ce jeu est appelé en France métropolitaine "Le Furet" et s'accompagne d'une chanson.



accueilli par ce groupe de jeunes filles anxieuses de lui faire croire, à tour de rôle, qu'il est l'élus. Pour rendre le jeu plus compliqué, les jeunes filles ne choisissent généralement pas leurs amoureux. Après sérieuse étude des comportements, le jeune homme s'assoit à la place qu'il croit lui être réservée. S'il ne fait pas erreur, il y reste et peut suivre la déconvenue de ses compagnons qui vont se présenter à tour de rôle. S'il se trompe, il est renvoyé pour ne revenir que lorsque ses compagnons se seront tous présentés.

### **38. La toilette en général:**

Placer autour de la pièce autant de chaises qu'il y a de joueurs. Un chef passe demander à chacun des joueurs quel morceau de la toilette de madame il choisit. Et des souliers au chapeau, la distribution se fait. Le chef retourne au centre, ce pendant que tous les joueurs sont assis. Il crie: "Madame demande sa robe et ses gants." Les deux joueurs qui ont choisi chacun de ces articles se précipitent pour changer de chaise, ce pendant que le joueur du centre tente de voler un de ces deux sièges. S'il n'y réussit pas, il reste au centre. S'il y réussit, il est remplacé par celui qui s'est fait chasser. A un moment donné, le joueur du centre crie: "Madame demande sa toilette en général." Tous les joueurs changent alors de siège et ce chahut permet généralement au joueur du centre de se trouver un siège.

### **39. La chaise honteuse:**

Un joueur est désigné pour occuper la chaise honteuse placée en évidence devant les joueurs assis en cercle autour de lui. Un autre joueur enquête auprès de l'assistance pour savoir ce que chacun dit de l'accusé. Après avoir recueilli tous les reproches chuchotés à son oreille, l'enquêteur revient à la chaise en disant: "Il y en a qui trouve que tu as les oreilles à pic. Il y en a qui trouve que tu as les yeux caille. Il y en a qui trouve que tu fais ton fier, etc." Après avoir entendu cette litanie, le joueur choisit le qualificatif qui lui a le plus déplu et l'auteur vient le remplacer sur la chaise. A son tour, il devient enquêteur. Et l'on repasse ainsi en revue tous les joueurs.

### **40. La queue de l'âne:**

On fixe au mur le dessin d'un âne sans queue. On distribue à chacun des joueurs une queue en carton. Chaque joueur, les yeux bandés, doit tenter d'aller épingle la queue de l'âne au bon endroit. Comme on n'y réussit jamais, l'assistance s'en amuse. Celui qui réussit à fixer la queue au meilleur endroit est le gagnant.

### **41. Le colin-maillard:**

Un joueur a les yeux bandés, ce pendant que les autres se dispersent dans l'appartement sans avoir pourtant le droit de se cacher. A tâtons, il cherche à se saisir d'un joueur. Mais on tente de le dépister, tout en le provoquant d'une pincée ou d'une tape en passant. Quand enfin, il attrape quelqu'un, on ne doit plus le soumettre à aucune épreuve. Il cherche alors, au moyen de ses mains, à identifier le joueur. S'il y réussit, ce dernier le remplace au centre. Dans la négative, il continue le jeu.



#### 42. La main chaude:

(Ce jeu était, il y a soixante-dix ans, appelé le "Chien blanc" à Paspébiac.)

Un joueur, au milieu de l'assemblée, a les yeux bandés et une main sur les reins. À tour de rôle les joueurs viennent lui donner une tape dans la main. S'il ne découvre pas le nom de celui qui l'a frappé, il continue à jouer son rôle. S'il y réussit, celui qui est découvert le remplace.

#### 43. L'écuelle:

Les joueurs sont assis en cercle, portant chacun un numéro. (De 1 à 10 ou 15, selon le nombre de joueurs.) Un joueur est au centre, tenant une écuelle en main. Il la descend sur le parquet, dans une position verticale, et, lui donnant assez d'élan pour la faire tourner comme une toupie, il se retire aussitôt en criant le numéro de celui qui doit la prendre en main avant qu'elle ne s'écrase. Si le joueur est distrait, ou s'il est lent, c'est lui qui devra remplacer l'autre joueur au centre et, de plus, remettre un gage qu'il ne recouvrera qu'après avoir accompli la "pénitence" infligée. Aussi, les meilleurs joueurs savent-ils qu'il ne faut pas crier le numéro d'un joueur alors que l'écuelle ne commence qu'à tourner; il faut laisser à chacun tout juste le temps de se précipiter pour ramasser l'écuelle.

### LES "PÉNITENCES"

Les "pénitences" sont des punitions que doivent subir les joueurs afin d'affranchir le gage qu'ils donnent après avoir subi un échec au jeu. Voici les plus courantes:

#### 44. Passer en petite boîte d'amour:

Le perdant s'adresse à chacun des membres de l'assemblée en lui demandant: "J'ai une petite boîte d'amour qui contient trois choses: aimer, chérir, embrasser. Que choisissez-vous?" Si l'on choisit "embrasser", on doit payer d'un baiser.

#### 45. Passer en singe:

Le perdant s'adresse à chacun des membres de l'assemblée. Il doit imiter le geste ou la grimace qu'on lui fait.

#### 46. Passer en souris:

Le perdant s'adresse à chacun des joueurs en disant: "Si j'étais souris, que feriez-vous de moi?" Et il encaisse les réponses plaisantes ou désagréables de l'assistance.

#### 47. Pleurer son sort:

Le perdant, placé au centre de l'assemblée, se recouvrant le visage de ses mains, pleure. Quelqu'un s'avance et lui demande: "Qu'est-ce que t'as à pleurer?" Et il donne la raison de son chagrin. Il dira, par exemple: "J'ai perdu ma femme." L'autre reprend: "Si je te la montrais, la recon-

naîtrais-tu?" Le pleureur répond: "Oui." Et on lui amène alors des sujets qui ne correspondent pas toujours à ses goûts, jusqu'à ce qu'à la fin, on lui présente sa femme ou son amoureux.

#### 48. Chanter le coq:

Le perdant s'avance au milieu de l'assemblée et imite le cri du coq.

Pour ajouter au ridicule de ces pénitences, les malins piquent une longue queue de guenille sur les reins du perdant qui, ne s'en doutant pas, s'inquiète secrètement du fou-rire de l'assistance.

A la série de ces jeux s'ajoute celle des devinettes dont nous avons parlé dans "La littérature orale en Gaspésie" et celle des jeux de cartes, de dames et de "barrau". Nous tenons aussi à signaler l'existence d'un amusement très courant en Gaspésie, celui de la gageure du Philippina qui est devenue un jeu social et familial.

#### 49. Philippina:

Deux personnes, après s'être partagé deux amandes jumelles, conviennent que, lorsqu'elles se reverront, celle des deux qui criera: "Philippina" la première gagnera l'enjeu.

D'autres conviennent que celle des deux qui parlera la première à l'autre, ou qui acceptera quoi que ce soit de l'autre, perdra l'enjeu.

### C. JEUX D'ENFANTS

Sauf dans les cas où les parents ont eux-mêmes patronné les parties d'amusements chez les enfants, leur enseignant comment "danser le petit bonhomme", comment "peser le lard" ou comment jouer à la "main chaude", "tirer du poignet" ou "tirer de la jambette", les enfants, laissés à leur propre initiative, se sont adonnés à des jeux qui leur étaient particuliers. Ce sont des jeux scolaires collectifs<sup>1</sup>. Parmi les jeux d'adultes décrits plus haut, nous n'avons noté que les jeux suivants en usage chez les enfants: le Colin-Maillard, la Queue de l'âne, Cache ma bague, Philippina, la Main chaude.

Avant de présenter les principaux jeux scolaires que nous avons recueillis en Gaspésie, nous verrons comment les petits connaissent, eux aussi, des moments heureux lorsque la grande sœur ou les parents jouent en leur compagnie, ou, lorsqu'un peu plus tard, ils commencent à se tirer d'affaire par eux-mêmes.

#### 50. Le bourdon:

L'enfant place ses deux mains paume contre paume, descendant ses pouces à l'égalité de ses index. Un adulte place un crayon ou une règle sur ses mains et, en imitant la voix du bourdon, il promène longtemps ses deux mains autour du crayon ou de la règle. A un moment donné, l'adulte se décide à saisir le crayon et à en donner un coup sur les mains de l'enfant, en criant: "Bourdon." Il appartient à l'enfant à se retirer les mains dès que l'adulte a touché le crayon s'il ne veut recevoir le coup.

<sup>1</sup>Jeux auxquels s'associent rarement les garçons, si ce n'est dans les cas où nous soulignerons la présence de "joueurs". Là encore il faudra reconnaître qu'ils font partie de l'exception (au sein de hameaux) puisqu'ils ne s'adonnent généralement qu'au jeu de balle et au saut à la perche.

### 51. La main morte:

On demande à l'enfant de faire la main morte, c'est-à-dire de relâcher tous les muscles de sa main droite ou gauche. On se saisit alors de sa main que l'on balance de haut en bas, en disant: "Main morte, main morte." Finalement, on crie: "Main morte" en faisant taper la main de l'enfant contre son visage.

### 52. La cachette dans la main:

ou: Le petit rien tout neu':

Un adulte dit à l'enfant qu'il a pour lui un "beau petit rien tout neu'" à lui offrir. Il le place dans une de ses mains, par derrière son dos, puis il présente ses deux mains à l'enfant qui doit choisir la main contenant le petit trésor. Pour y arriver, il récite la comptine suivante, en touchant, à chaque mot, l'une et l'autre main: "Mon père m'a dit de prendre celle-là qui me plaira le plus."

### 53. Monte échelle:

Ce jeu se joue à deux ou plus. Sur une table, on place ses poings les uns par-dessus les autres. Un adulte monte, avec son doigt, l'échelle que constituent les jointures, en disant: "Monte, échelle." L'enfant répond: "Monte-la." Les quatre premières jointures passées, l'adulte arrive au "p'tit trou" que forme la main fermée. Il dit: "Petit trou." L'enfant répond: "Casse-cou." Et l'on continue ainsi jusqu'à ce qu'arrivé en haut, le dialogue continue dans ces termes:

—Ti-trou.

—Casse-cou.

—Qu'est-ce qu'il y a dedans?

—Un p'tit baril d'argent.

—Qui l'a mis?

—Père et mère.

—Qui l'a ôté?

—Frère et sœur.

—Tourne, tourne le p'tit baril d'argent; celui qui rira devant aura une claque sur la g . . .

Ici les poings se retirent et c'est à qui ne rira pas le premier, ce pendant que l'adulte feint de faire tourner un petit baril sur son doigt.

### 54. Aimes-tu le beurre:

"Aimes-tu le beurre?" demande-t-on à quelqu'un. Interloqué par une question aussi saugrenue, l'interpellé hésite un moment. Aussi a-t-on le temps de lui passer un bouton d'or sous le menton et de lui répondre affirmativement ou négativement, selon que la réflexion de cette fleur jaune est plus ou moins marquée.

### 55. Danser de la corde:

Ce pendant que deux fillettes font tourner la corde de façon à ce qu'elle touche le sol, une troisième joueuse saute à deux pieds, ou à cloche-pied,

au rythme des paroles prononcées. Le mot sur lequel elle trébuche indique le nom de celle qui, l'ayant choisi, la remplacera. Voici les formules d'usage recueillies :

"Rentre ti-Pierre, rentre ti-Paul, deux petits oiseaux sont sur la branche, un s'appelle ti-Pierre, l'autre s'appelle ti Paul, sors ti-Pierre, sors ti-Paul."

"Soie, satin, coton, guenille."

"Crème à la glace  
Limonade sucrée  
Dis-moi le nom d'un cavalier  
a b c d, etc . . .  
Oui . . . Non . . ."

La lettre sur laquelle trébuche la joueuse détermine l'initiale du cavalier qu'elle épousera. Elle continue afin de savoir si elle aura des enfants. Pour en connaître le nombre, elle poursuit à l'aide de chiffres. A "oui", on compte le nombre d'enfants par chiffres.

Quand elle manque un pas, elle continue pour savoir comment elle les habillera :

"Soie, guenille, torchon, chiffon  
Bleu, blanc, rouge."

Mais avant la fin du jeu, elle veut connaître quelle voiture la mènera le jour de ses noces :

"Char, camion, autobus."

#### 56. La tournette :

Deux joueuses, face à face, sur la pointe des pieds, piétinent jusqu'à l'étourdissement de l'une des deux.

#### 57. Les quatre coins :

Aux quatre coins d'un carré dessiné sur le sol, quatre joueuses sont placées. Une cinquième joueuse fait le guet au centre. Pendant que, deux à deux, les quatre joueuses changent de but, la cinquième joueuse tente de voler le premier coin qui sera vacant. Si elle y réussit, celle qui a perdu sa place remplacera l'autre au centre.

#### 58. Le téléphone :

Les joueuses sont rangées sur une même ligne. La première chuchotte une phrase à l'oreille de sa voisine qui, à son tour, la répète à sa compagne. Ainsi transmise à mi-voix d'une joueuse à l'autre, la phrase se défigure pour devenir toute autre lorsqu'il s'agit de la répéter à la meneuse du jeu. De là l'amusement du groupe.

#### 59. Le drapeau :

Les joueurs sont divisés en deux camps; deux d'entre eux surveillent chacun des deux groupes. D'un côté, le drapeau flotte au vent. De



l'autre, on tente de le voler. Aussi le gardien doit-il surveiller l'arrivée du voleur qu'il tuera en le touchant de la main. Et la lutte continue jusqu'à ce que le camp opposé réussisse à s'emparer du drapeau.

#### 60. Les grimaces:

Un joueur s'isole dans une chambre, ou à l'écart, à l'extérieur. Un autre joueur est tourné plusieurs fois sur lui-même par ses compagnons, jusqu'à ce qu'il soit complètement étourdi. La position qu'il tiendra dans son abasourdissement devra être imitée par le joueur sortant de sa cachette. S'il n'y réussit pas, il devra donner un gage.

#### 61. Le serpent:

Une corde est attachée à un coin de la galerie, et tenue horizontalement, à l'autre extrémité, par une joueuse qui tente d'arrêter chaque compagne qui veut passer en dessus ou en dessous de cet obstacle. Si les joueuses ne sont pas assez vives pour sauter prestement la corde, elles se font entortiller par cette dernière et sont placées au rang des morts. Le jeu se termine avec l'emprisonnement de chacun des membres du groupe, ou avec la victoire de l'une des joueuses.

#### 62. Le loup et les brebis:

Un groupe de joueuses, symbolisant les brebis, se promènent, en disant:

“Promenons-nous dans le bois pendant que le loup n'y est pas.  
S'il y était, nous mangerait-il?”

Pendant ce temps, une joueuse, représentant le loup, à l'écart, s'écrie:

— Je me lève.

Le groupe continue:—Promenons-nous dans le bois, etc.

— Je m'habille, poursuit le loup.

— Promenons-nous dans le bois, etc.

— Je mets mes culottes.

— Promenons-nous dans le bois, etc.

— Je pars.

Et le loup tente d'attraper celle qui le remplacera.

#### 63. Les couleurs:

Une meneuse de jeu demande à chaque joueuse de choisir le nom d'une couleur. Pendant ce temps, deux joueuses, le bon Dieu et le diable, sont à l'écart. La première se présente, en frappant trois coups sur le sol avec sa canne d'or. Le maître de cérémonie la reçoit et engage le dialogue avec elle:

— Qui est là? demande-t-il.

— C'est le bon Dieu avec sa canne d'or.

— Qu'est-ce qu'il vient faire?

— Il vient chercher une couleur.

— Quelle couleur?

— Blanc (ou rouge, vert, etc.).

La meneuse de jeu fait alors passer au rang des élus celle des joueuses qui a choisi le blanc. Si personne ne l'a choisi, le bon Dieu s'en retourne, sans ramener un sujet. Le diable s'avance à son tour, en frappant trois fois le sol avec sa canne de fer. Et le dialogue reprend :

- Qui est là?
- Le diable avec sa canne de fer.
- Qu'est-ce qu'il vient faire?
- Il vient chercher une couleur..., etc.

Et le bon Dieu et le diable se présentent ainsi, à tour de rôle, jusqu'à ce que toutes les joueuses aient été choisies en formant partie de l'un ou l'autre des deux camps. C'est alors que, derrière leur chef se tenant par la main, les joueuses, les bras noués à la taille de l'une et de l'autre, tirent en reculant. Le camp le plus fort l'emporte.

#### 64. L'écartée, aussi appelée le mouchoir :

Les joueuses, debout, forment un cercle. L'écartée court autour des joueuses, un mouchoir en main. Lorsqu'elle décide de laisser tomber le mouchoir derrière une compagne, cette dernière doit la poursuivre jusqu'à ce qu'elle l'attrape. Si, par malheur, elle ne sait pas suivre les mêmes détours que la meneuse du jeu, elle devient l'écartée et l'autre reprend sa place. Si, au contraire, elle réussit à l'atteindre, elle est libérée et reprend sa place.

#### 65. L'original et ses chiens :

Au moyen d'une comptine, on choisit celui qui représentera l'original. Tous les membres du groupe deviendront alors des chiens que poursuivra l'original. Chaque fois qu'un chien sera saisi par ce dernier, il deviendra à son service et partira, à son tour, à la poursuite des autres chiens. Le jeu se termine lorsque tous les chiens ont été rejoints.

#### 66. La taque :

Celui qui a été choisi au moyen d'une comptine poursuit ses compagnons jusqu'à ce qu'il en ait touché un, en lui disant : "Tag". A son tour, ce dernier tente de transmettre la taque à un autre joueur. Il est défendu de rendre la taque à celui qui la donne, tout comme un joueur devient intouchable s'il s'écrie : "Je m'en défends", afin de se retirer du jeu pour se reposer. Ce jeu, sous toutes ses variantes (l'Écartée, l'Original et ses chiens, la Taque malade ou baissée), se pratique dans toutes les régions de la Gaspésie.

#### 67. La taque malade :

Là où le joueur a été touché en recevant la taque, là il doit garder la main, tout en courant à la poursuite d'un compagnon. Selon qu'il a été touché à la tête ou aux pieds, il peut se trouver dans une position difficile et ridicule.

**68. La taque baissée:**

Le joueur poursuivi n'a qu'à s'écraser sur ses jambes au moment où on doit lui donner la taque pour devenir intouchable. Mais afin de provoquer le coureur, on persiste souvent à courir debout avant que de s'accroupir, et on reçoit la taque au moment le plus inattendu.

**69. La cachette:**

Un joueur, désigné au moyen d'une comptine, se retire à un endroit indiqué et, la tête entre ses deux mains, attend que les joueurs se soient cachés. Lorsqu'ils sont tous placés, ils crient: "Hou-Hou" et le chercheur tente de les trouver. Le premier découvert le remplace, ce pendant que le chercheur se cache à son tour.

**70. L'Espagne:**

Ce jeu de cachette est plus turbulent que le premier; et nous verrons aussi pourquoi les cachettes se font dans un rayonnement plus limité. Le chercheur compte d'abord jusqu'à 50 pour donner aux joueurs le temps de se cacher. Avant de partir à leur poursuite, il s'écrie: "Un, deux, trois, pour ceux qui ne sont pas prêts." Et lorsqu'il découvre un joueur caché, il doit s'empresse de venir "l'espagner" au but déterminé, en disant: "J'espagne X." Très souvent cependant, c'est celui qui est caché qui réussit à venir espagner le chercheur. D'autre part, un joueur peut sortir de sa cachette avant d'avoir été découvert, pour venir "espagner" le chercheur; puis il s'en retourne se cacher, guettant la première chance qui s'offrira d'en "espagner" un autre. Tous ceux qui sont "espagnés" sont morts. Le jeu se termine lorsque tous les joueurs ont été espagnés, si ce n'est le joueur vainqueur.

**71. Beau cordonnier:**

Un joueur ou une joueuse représente le beau cordonnier et s'avance devant un groupe de fillettes se promenant bras dessus, bras dessous. Un dialogue s'engage entre le cordonnier et les joueuses:

- Belles demoiselles, où allez-vous toutes comme ci, où allez-vous toutes comme ça?
- Beau cordonnier, nous allons nous promener.
- Belles demoiselles, vous userez tous vos souliers.
- Beau cordonnier, vous nous les raccommoderez.
- Belles demoiselles, qui de vous les paiera?
- Beau cordonnier, celle que vous attraperez.

Et le cordonnier poursuit les demoiselles.

**72. Le chat et la souris:**

Les petites filles font cercle, en se tenant par la main. Celles qui représentent le chat et la souris sont placées l'une au centre et l'autre à l'extérieur. L'espoir du chat est d'attraper la souris, mais le désir des joueuses réunies est de l'empêcher d'arriver à ses fins. Pour cela, elles se serrent les unes contre les autres quand le chat veut se filouter entre leurs rangs. Le jeu se termine à la mort de la souris.

**73. Les petits chats:**

Les élèves les plus âgées forment un cercle et placent chacune une jeune élève en avant d'elles: leur petit chat. Une seule joueuse n'a pas son petit chat et tente de voler celui qui appartient à une compagne. Il lui faut d'abord toucher de la main celle à qui elle veut voler le chat, ce qui oblige cette dernière à courir autour du groupe, en sens contraire de l'autre. Or, la première qui revient au petit chat et le touche de la main devient son propriétaire. Et l'on joue aussi longtemps qu'on le désire.

**74. Les métiers:**

Les joueuses sont alignées sur deux rangées, face à face. Le premier camp fait, à l'insu de l'autre, le choix d'un métier: cordonnerie, tricot, etc... Et, à haute voix, l'on entonne ensemble: "Nous venons de Montréal (ou d'un autre endroit), nous avons appris le métier de..." Et une joueuse mime le caractère de son métier.

Les joueuses du camp d'en face tentent de deviner le nom du métier. Celle qui devine la première et réussit à toucher de la main celle qui a mimé son métier, fait passer cette dernière dans son camp.

L'autre camp fait, à son tour, le choix d'un métier et tente de mystifier le camp opposé afin de ne pas perdre de joueuses. Le camp vainqueur est celui qui reste avec le plus grand nombre de joueuses.

**75. La balle au camp:**

Ce jeu de balle est pratiqué de la même façon que le "base-ball". Généralement particulier aux garçons, il est aussi joué par les filles cependant. On le retrouve dans toutes les parties de la Gaspésie, sans variante.

**76. Sauter à la perche:**

Deux joueurs tiennent, horizontalement, une perche de dix pieds de longueur, à huit pieds du sol. Un troisième joueur, une perche en main, se donne un élan pour sauter par-dessus cette perche.



# MOLLUSCA FROM THE TERTIARY OF PRINCETON, BRITISH COLUMBIA

*By Loris S. Russell*

## INTRODUCTION

In 1954 two months were spent in a reconnaissance of the Tertiary sedimentary rocks of southern British Columbia from Victoria to Grand Forks. The principal purpose of the examination was to try to find identifiable remains of mammals and molluscs. The search was only partly successful. Fossil plants are abundant in most of these rocks; animal remains are scarce, and in most occurrences represent only fishes and insects, which, like the plants, are preserved on thin, tuffaceous shale. Only in the Princeton district, in the valleys of the Tulameen and Similkameen Rivers, have identifiable mammals and molluscs been found. It is the purpose of the present paper to describe the fossil molluscs from this area. These include not only material collected by me in 1954, but also specimens obtained earlier by members of the Geological Survey of Canada, notably H. M. A. Rice and W. A. Bell. Type specimens have been placed in the invertebrate palæontology collection of the Geological Survey of Canada.

I am indebted to Dr. H. M. A. Rice and the late Dr. W. E. Cockfield for supplying data on localities and occurrences; and to Dr. J. E. Armstrong, Dr. W. L. Fry, and Dr. H. W. Little with whom I visited fossil localities in various parts of British Columbia. At Princeton, valuable information was given by Mr. Williams, retired coal mine operator, who also conducted me to several localities.

The fossil molluscs of the Princeton district occur in the sedimentary rocks of the Princeton group (Rice, 1947, pp. 27-31). These are associated and intercalated with porphyritic lavas. The sedimentary rocks range from conglomerate and coarse sandstones to laminated tuffaceous shales and coal seams. The fossil molluscs are usually found in the carbonaceous shales and in such occurrences are often badly crushed. Uncrushed shells are found in hard, calcareous sandstone. In the following paragraphs the locality data and geological position are set forth, followed by a list of the fossils obtained from that particular site.

### **Princeton Coal and Land Company Mine**

This is a large open pit on the right or south bank of the Similkameen River, near the mouth of the Tulameen River, and just east of the bridge on Highway No. 3. It is on the southeastern outskirts of the town of Princeton. The pit exposes shale, sandy shale, and carbonaceous shale merging below into a thick coal seam. Where this transition is exposed on the north side of the pit there is a thin bentonitic bed, and immediately over

this is a thin bed of indurated shale, with patches of crushed shells and some bone fragments. The following identifications have been made on specimens from this locality.

*Sphaerium* sp.

*Gyraulus* sp.

*Physa* sp.

### Princeton Tulameen Coal Company Mine

This mine, non-operating since 1944, is located on the north side of the Tulameen River about one mile west of Princeton. Numerous low dumps, partly burned, lie on the valley floor southwest of the workings. The rock consists of grey fissile shale and reddish friable or indurated shale. The latter contains numerous fossil shells, more or less crushed. Specimens obtained from here have been identified as follows:

*Sphaerium* sp.

*Micropyrgus camseli*, n.sp.

*Ferrissia arionoides*, n.sp.

*Gyraulus* sp.

*Physa* sp.

### Vermilion Cliff

This locality is also known as Vermilion Bluff and Red Bluff. It is located about two miles west of Princeton on the Canadian Pacific Railway and is a large, cliff-forming outcrop of sedimentary rocks, directly across the Tulameen River from the abandoned Pleasant Valley Coal Mine. The rocks that make up the cliff are mostly hard, poorly bedded siltstones, some with siliceous cement, others calcareous. There are a few lenses of carbonaceous, poorly fissile shale. Although buff, grey, and even blue layers are present, the predominant colour is brick red, undoubtedly the result of combustion of associated coal seams. This brilliantly coloured cliff has long been a landmark and is said to have been the source of red pigment used by the native tribes of this district. The original name for Princeton—Vermilion Forks—was derived from this locality. George Dawson (1879, pp. 130-132) described the exposure in detail and recorded the presence of "well preserved and silicified fresh-water shells, belonging to the genera *Limnaea* and *Physa* and *Sphaerium*". My observation was that the fossils were commonest near the western end of the cliff, but I was unable to locate the actual bed or beds from which they were falling. Pieces of rock with fossils occurred up to the top of the talus slope. The following species have been recognized here:

*Stagnicola tulameenensis*, n.sp.

*Physa saxarubrensis*, n.sp.

*Aplexa ricei*, n.sp.

The main exposure of Vermilion Cliff terminates above at a coal seam, but intermittent exposures are found higher on the valley side, some of them prospect pits. Near the summit, about 300 feet above the railway, there

is a small open-pit coal working. Fragments of fissile shale, apparently from beneath the coal seam, contain the crushed shells of molluscs, which have been identified as follows:

*Sphaerium* sp.

*Gyraulus* sp.

*Physa* sp.

This fauna suggests the one obtained from the dump of the Princeton Tulameen Coal Mine, and the coal seam may be the same at the two occurrences.

### Pleasant Valley Coal Mine

This abandoned mine is situated on the south side of the Tulameen River valley, opposite Vermilion Cliff. It was from this mine that the two specimens of fossil mammal teeth were obtained (Russell, 1935; Gazin, 1953, p. 43). The entry has now collapsed, and careful search of the dumps failed to reveal any mammalian remains. There are, however, abundant fragments of fish skeletons and some slabs of shale carrying valves of *Sphaerium* sp., possibly the same species as that occurring at the previously mentioned localities.

### AGE OF THE FAUNA

The fossil molluscs from Princeton are not in themselves diagnostic of age, as they all apparently represent new species. The age of the sedimentary rocks within the Princeton group has been discussed by Rice (1947, pp. 29-31). As he explains, the evidence of the flora points toward a Late Oligocene or Early Miocene age, and with this the fossil insects seem to be in accord. However, at the Pleasant Valley Coal Mine, as noted above, two specimens of fossil mammal teeth were found, which have been referred to species of *Tragosus* (Russell, 1935; Gazin, 1953, p. 43). This genus has not been found in beds younger than Middle Eocene. The fossil fishes, occurring in the paper shales, resemble those of the Florissant shales of Colorado, which are now assigned to the Middle Oligocene.

All these conflicting data could be reconciled if we assumed that the lower sedimentary beds in the Princeton group are of Middle Eocene age and the upper beds of Oligocene age. Although no unconformity has been found in these strata, the structural data are not opposed to this conclusion. The molluscs from the Princeton Coal and Land Company Mine, the Princeton Tulameen Coal Company Mine, and the open-pit working above Vermilion Cliff are from the upper part of the sequence, and would, according to the hypothesis, be of Oligocene age. The specimens from Vermilion Cliff would be of about the same age as the fossil mammals from the Pleasant Valley Coal Mine, i.e., Middle Eocene. This view is supported by the differences between the molluscan faunas from the coal mines and those from Vermilion Cliff. The significance of the imperfect specimens of *Sphaerium* from the Pleasant Valley Coal Mine is not yet understood.

## DESCRIPTIONS

## Class PELECYPODA

## Family Sphaeriidae

*Sphaerium* sp.

## Plate I, figure 1

*Referred specimen.* Geol. Surv., Canada, No. 11613; partly exfoliated valve on red shale.

*Occurrence.* Princeton beds in Princeton Tulameen Coal Mine, west of Princeton, British Columbia.

*Description.* Shell small, symmetrical, ends well rounded. Umbones large and rounded, rising well above the hinge line; postumbonal ridge appears to be present, but this may be due to crushing. Surface with faint growth lines. Length, 5.1 mm., height, 3.7 mm.

*Remarks.* Fragments of this small *Sphaerium* occur rather abundantly in the reddish shale on the coal mine dumps, but only one specimen has been found that shows the shape of the entire valve. Even on this specimen, the nature of the hinge line cannot be determined. It would be interesting to compare this shell with the specimens of *Sphaerium* collected by Cockfield (1948, p. 34) from the Coldwater beds at Merritt. Unfortunately Cockfield's specimens cannot be located at present. Dr. LaRocque, in his report on these specimens, compared them with *S. gemma* Dall (1924, p. 28) from the Tertiary of the Arctic Coast. If this comparison may be used, then the Merritt shells are larger and more inflated than those from Princeton, with more conspicuous markings.

## Class GASTROPODA

## Family Amnicolidae?

*Micropyrgus camseli*, n. sp.

## Plate I, figure 5; Plate II, figure 7

*Type.* Geol. Surv., Canada, No. 11614; a complete shell exposed on dorsal side, on same piece of red shale as No. 13279.

*Occurrence.* Princeton beds in Princeton Tulameen Coal Mine, west of Princeton, B.C.

*Description.* Shell small, slender, imperforate; volutions five, slightly convex, increasing gradually in size; spire obtuse at apex. Aperture narrowly ovoid, peristome incomplete on inner side. Surface marked by fine growth lines. Length of type, 5.9 mm.; width, 2.3 mm.; length of body whorl at aperture, 2.3 mm.

*Remarks.* This is one of the commoner shells in the shale from the Princeton Tulameen Coal Mine and is readily recognizable. It differs from modern amnicolids in the slenderness of the shell, the nearly flattened sides



of the whorls, and the incomplete peristome. In these features it falls within the definition of the genus *Micropyrgus* Meek (1876, p. 574), which was erected for a species of gastropod, *M. minutulus* (Meek and Hayden), from the Fort Union of North Dakota. In *M. minutulus* the surface of each whorl slopes outward for about two-thirds of its width, then turns abruptly inward to the anterior suture, producing a subangular revolving ridge anterior to the middle of each whorl. This peculiar form of whorl is absent in *M. camselli*, which has gently convex whorls. Also, the number of whorls is less, and the spire not so tapering. These differences are regarded as of specific rank.

By expanding the concept of the genus *Micropyrgus* to include the present species, we also make it include *Hydrobia higdoni* Russell (1937, p. 63), from the Oldman formation (Upper Cretaceous) of southern Alberta.

The specific name is in honour of Dr. Charles Camsell, who made the first detailed geological survey (1907) of the Princeton area.

### Family Lymnaeidae

#### *Stagnicola tulameenensis*, n. sp.

Plate I, figures 2-4

*Type.* Geol. Surv., Canada, No. 11616; a complete shell.

*Occurrence.* Princeton beds, lower part of Vermilion Cliff, west of Princeton, B.C.

*Description.* Shell small, slender, volutions about six. Spire slender, whorls gently convex, apex rounded. Aperture about two-fifths total length of shell, narrowly ovoid, inner lip thickened. Surface with fine growth lines. Length of type, 6.9 mm.; width, 2.8 mm.; length of aperture, 2.5 mm.

*Remarks.* This little lymnaeid is very similar to "*Limnaea*" *minuscula* White (1881, p. 160) from the Middle Eocene of Wyoming; in fact, the only distinguishing feature is the faintness of the growth lines, which are well defined in White's species. I am not prepared, however, to identify the Princeton specimens as *Stagnicola minuscula*, as the types of that species are imperfect and the uncertainty of the identification would not justify its geological implications. For these reasons I have proposed a new species for the Princeton specimens, which can be reduced to synonymy if later discoveries warrant this procedure. *S. tulameenensis* can be distinguished readily from most other species of *Stagnicola* by the slenderness of the shell and the elongation of the spire. Some living species, such as *S. palustris* (Miller) and *S. elodes* (Say), have varieties in which the shell is equally slender, but in these the apex is distinctly pointed.

On another rock fragment from Vermilion Cliff there are samples of a slender lymnaeid (Plate I, figure 4) in which the spire is even more elongated than in the type of *S. tulameenensis*. These may represent a second species, but for the present they are being referred to *S. tulameenensis* until we have more data on the range of variation in that species.

## Family Ancyliidae

*Ferrissia arionoides*, n. sp.

Plate I, figure 5

*Type.* Geol. Surv., Canada, No. 13279; a partly exfoliated shell preserved on red shale.

*Occurrence.* Princeton beds in Princeton Tulameen Coal Mine, west of Princeton, B.C.

*Description.* Shell small, symmetrically oval in outline; moderately elevated to a rounded median ridge, which is situated to the right of centre; slope on right side convex, on left side gently concave. Apex located to the right of midline, and decurved, overhanging the posterior margin. Surface marked by fine concentric lines of growth; exfoliated area near centre shows radiating structure. Length of type, 5.1 mm.; width, 3.0 mm.

*Remarks.* *Ferrissia arionoides* is analogous to *F. shimekii* (Pilsbury) in the Recent fauna in the posterior and asymmetrical position of the apex. However, *F. shimekii* has a short, deep shell, with a relatively erect apex, and is therefore quite distinct from the present species.

Two species of *Ferrissia* occur as fossils in Alberta: *F. minuta* (Meek) in the Cretaceous and Paleocene, and *F. radiatula* (Whiteaves) in the Paleocene. The shell in both of these species is more like that of modern examples, in that the apex is located not much off centre, in contrast to the marginal apex of *F. arionoides*.

The specific name refers to the superficial resemblance of the shell to the vestigial shell of some arionid slugs.

## Family Physidae

*Physa saxarubrensis*, n. sp.

Plate II, figures 1-4

*Type.* Geol. Surv., Canada, No. 13280; a complete shell.

*Occurrence.* Princeton beds at Vermilion Cliff, west of Princeton, B.C.

*Description.* Shell small, robust, moderately elongated; volutions five, convex; spire rather long, apex rounded. Aperture ovoid, not expanded, length a little more than half that of shell; inner lip with slight columellar fold. Surface marked by well-defined growth lines and on some specimens by a resting varix on the body whorl. Length of type, 9.7 mm.; width, 4.9 mm.; length of aperture, 5.2 mm.

*Remarks.* Although clearly a *Physa*, the present species is in contrast to most of those in the Recent fauna in having the spire almost as long as the aperture, and in lacking any inflation of the body whorl. Long-spined varieties are known in *Physa gyrina* Say, but they are not typical. However, the shell form characteristic of *P. saxarubrensis* is also seen in several

Cretaceous and early Tertiary species, such as *P. canadensis* Whiteaves, *P. disjunctus* (White), and *P. bridgerensis* Meek. In all of these species, however, the shell is much larger than in *P. saxarubrensis*.

The specific name is from the Latin, *saxa rubra*, red rocks, which was used as a place name in Etruria, and is here applied to Vermilion Cliff.

*Physa* sp.

Plate II, figure 5

*Referred specimen.* Geol. Surv., Canada, No. 13282, a badly crushed shell.

*Occurrence.* Princeton beds, Princeton Tulameen Coal Mine, west of Princeton, B.C.

*Description.* Shell large, delicate; volutions about six, rather flat, body whorl much longer than half length of shell. Surface marked by numerous growth lines, which are very distinct in places. Length of No. 13282, as preserved, 42.4 mm.; probably total length about 45 mm.

*Remarks.* The available specimens are not well enough preserved to form the basis of a specific determination, but they differ in almost every feature from the shells of *Physa saxarubrensis*. The relatively large body whorl and short spire are more suggestive of modern species of *Physa*, but in the uncrushed shell the body whorl was probably not so inflated as in most Recent species. It is thought that the uncrushed shell had about the size and proportions of *Physa bridgerensis* Meek (White, 1883, p. 45, Plate 19, figures 10a, 10b), a Middle Eocene species.

*Aplexa ricei*, n. sp.

Plate II, figure 6

*Type.* Geol. Surv., Canada, No. 13283; complete but slightly crushed shell, exposed on ventral side.

*Occurrence.* Princeton beds; Vermilion Cliff, west of Princeton, B.C.

*Description.* Shell rather small, delicate, slender; spire long and tapering; volutions five, gently convex. Aperture narrowly ovoid, distinctly less than half length of shell; inner lip thin, but with distinct columellar fold about midlength. Surface with very faint but regular growth lines. Length of type, 13.2 mm.; width, 5.4 mm.; length of aperture, 5.6 mm.

*Remarks.* This species is referred to *Aplexa* because of the slender shell and the elongate spire. There is no very close resemblance to the familiar *Aplexa hypnorum* (L.) of the Recent fauna, in which the shell is ovoid, and the sutures little impressed. The specific name is in honour of Dr. H. M. A. Rice.

*Gyraulus?* sp.

## Plate II, figure 7

*Referred specimen.* Geol. Surv., Canada, No. 13284, a partly exfoliated specimen.

*Occurrence.* Princeton beds; Princeton Tulameen Coal Mine, Princeton, B.C.

*Remarks.* A small planorbid is represented by imperfect specimens in the shale fragments from the dump of the Princeton Tulameen Coal Mine. The specimen designated as No. 13284 is the only one that is not badly crushed. It is seen from the left or apical side and has the appearance of a miniature shell of a *Helisoma*. There are about three whorls, which are all exposed but not impressed. The body whorl is well rounded and appears to be deflected to the left near the aperture. Some of the crushed shells that have the surface better preserved show obscure revolving markings. Maximum diameter of No. 13284 as preserved is 3.6 mm. The reference to *Gyraulus* is based on the small size and the apparent deflection near the aperture. The shell seems deeper for its diameter than is characteristic of modern species. Definite generic reference and specific determination must await the discovery of better preserved specimens.

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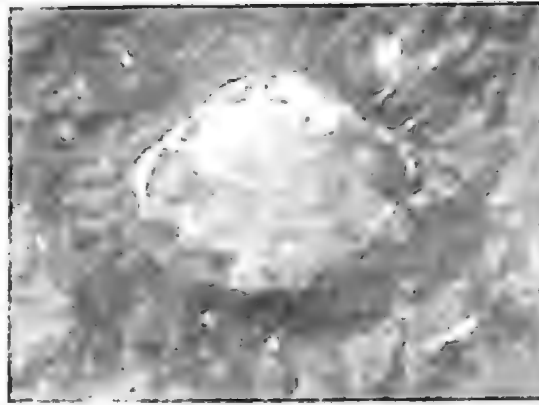
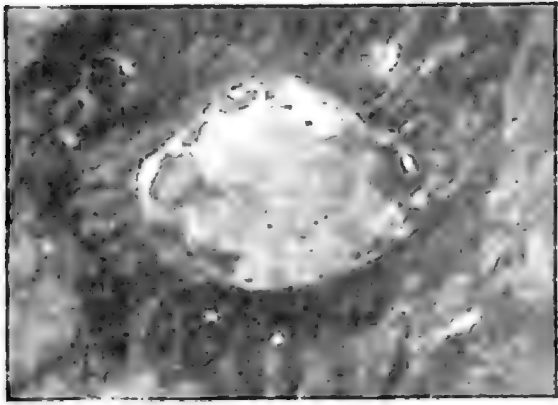
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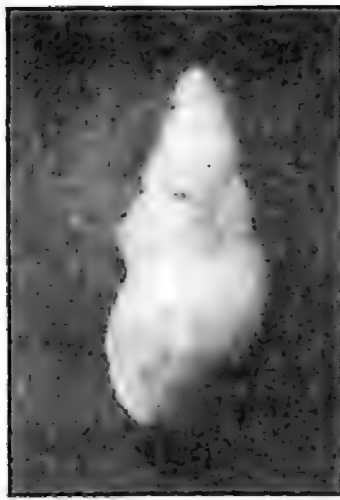
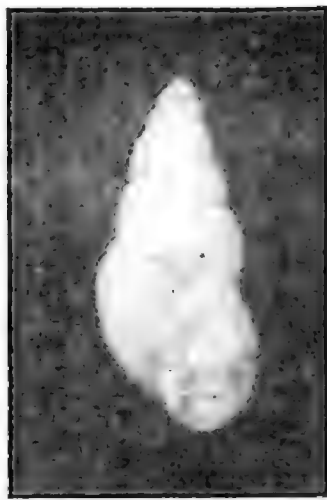
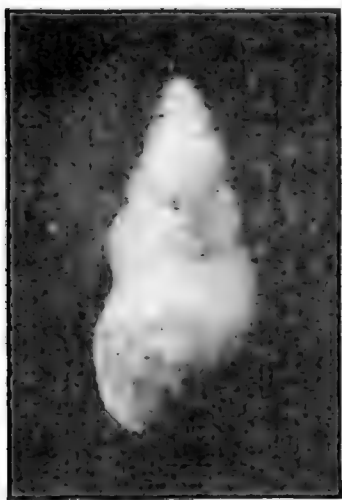
## PLATE I

All figures in stereoscopic pairs, and all X 4.

- Figure 1. *Sphaerium* sp., G.S.C. No. 11613, imperfect valve.
- Figure 2. *Stagnicola tulameenensis*, n. sp., G.S.C. No. 11616, holotype, dorsal view.
- Figure 3. *Stagnicola tulameenensis*, n. sp., G.S.C. No. 11616, holotype, ventral view.
- Figure 4. *Stagnicola tulameenensis*, n. sp., G.S.C. No. 11617, provisionally referred specimen, dorsal view.
- Figure 5. *Micropyrgus camSELLi*, n. sp., (on left), G.S.C. No. 11614, holotype, dorsal view, and *Ferrissia arionoides*, n. sp. (on right), G.S.C. No. 13279, holotype.



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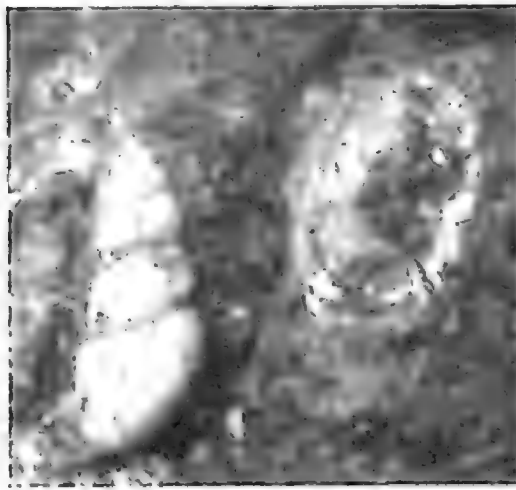
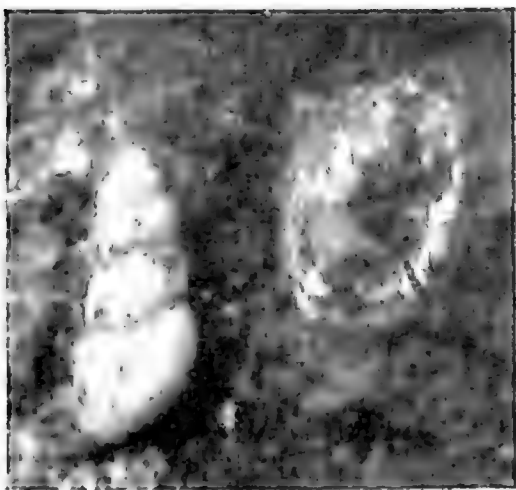


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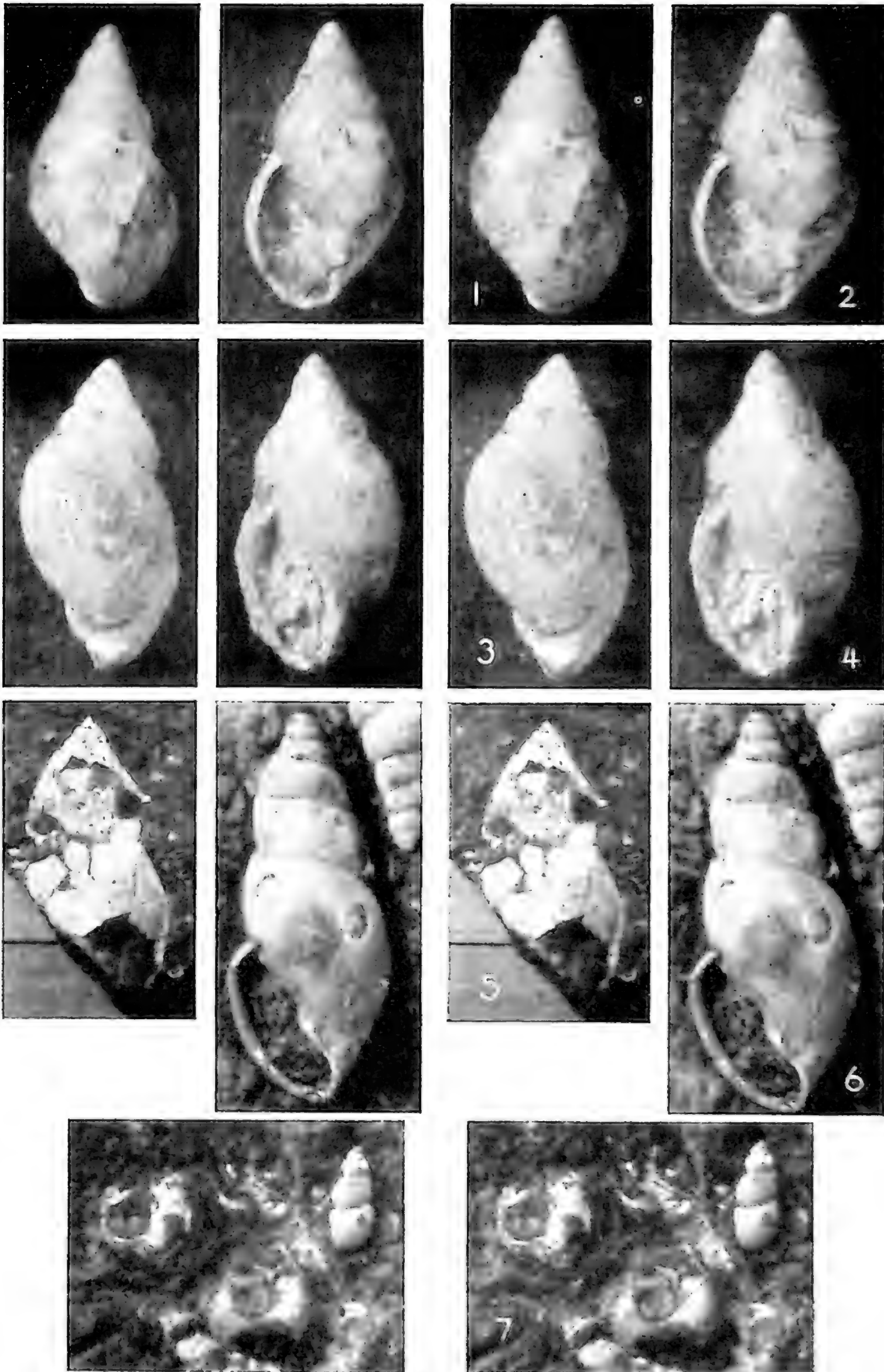


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## PLATE II

All figures in stereoscopic pairs, and all X 4 except figure 5, which is X 1.

- Figure 1. *Physa sazarubrensis*, n. sp., G.S.C. No. 13280, holotype, dorsal view.  
Figure 2. *Physa sazarubrensis*, n. sp., G.S.C. No. 13280, holotype, ventral view.  
Figure 3. *Physa sazarubrensis*, n. sp., G.S.C. No. 13281, paratype, dorsal view.  
Figure 4. *Physa sazarubrensis*, n. sp., G.S.C. No. 13281, paratype, ventral view.  
Figure 5. *Physa* sp., G.S.C. No. 13282, dorsal view, crushed.  
Figure 6. *Aplexa ricei*, n. sp., G.S.C. No. 13283, holotype, ventral view.  
Figure 7. *Gyraulus* sp., (lower centre), G.S.C. No. 13284, apical view, and *Micropyrgus*  
*camselli*, n. sp. (upper right), G.S.C. No. 11615, paratype, oblique dorsal view.





# PALEOCENE MAMMAL TEETH FROM ALBERTA

By Loris S. Russell

## INTRODUCTION

Earlier studies on the Paleocene vertebrates of Alberta (Russell, 1929, 1932) were carried out under the auspices of the University of Alberta and the Alberta Research Council. The specimens are preserved in the Department of Geology, University of Alberta. During the field season of 1955 I visited some of the localities, in company with Dr. Wann Langston, Jr., for the purpose of obtaining a representative series of these fossils for the National Museum of Canada. A return visit to favourite fossil localities after 26 years is an interesting experience.

Locality 2E, on Elbow River, in legal subdivision 3, section 4, township 24, range 1, west of 5th meridian, has not changed much in appearance, being still a high bank of ledges and talus slope. It is no longer at the southern limits of the City of Calgary, for the city has expanded southward, and a housing development is invading the "bench" above the cliff. Careful examination of the exposure failed to disclose even a trace of the rich shell bed which once extended along the cliff near the top of the talus slope for a distance of 100 feet or more. Apparently it has weathered away entirely, which is unfortunate; for in addition to many well-preserved specimens of *Lioplacodes limnaeiformis* (Meek and Hayden) and other "Fort Union" molluscs, it had yielded mammal teeth, bones of *Champsosaurus*, and other vertebrate remains. Near the downstream end of the outcrop there are still loose blocks of hard, calcareous sandstone containing numerous molluscan fossils. I was never able to locate the source bed of these blocks and believed that they came from under the talus slope, where they had been pried out by the spring ice. With the departure of the ice the talus would again cover the rock that was still in place. In my recent visit I saw no evidence against this explanation. These blocks are now the only source of mammal teeth at locality 2E, and several hours' work breaking and scrutinizing the sandstone resulted in the discovery of a number of specimens. The occurrence was brought to the attention of local geologists in the hope that they would search for newly exposed blocks each spring.

The combined list of mammalian identifications from locality 2E is as follows:

*Ectypodus cochranensis* (Russell)

*Parectypodus?* sp.

*Catopsalis calgariensis* Russell

*Pronothodectes* sp.

*Chriacus?* sp.

*Neoclaenodon?* sp.

*Tetraclaenodon* cf. *puercensis* (Cope)

Locality 1 at Cochrane, west of Calgary, is on the north bank of Bow River, in legal subdivision 7, section 4, township 26, range 4, west of 5th meridian. No identifiable vertebrate remains were found here during our 1955 visit, but this was not surprising, because I was never able to obtain additional mammal teeth here after the initial discovery by the late R. L. Rutherford and me in 1926. The specimens obtained at that time were identified as follows:

*Ectypodus cochraneensis* (Russell)  
*Diacodon septentrionalis* Russell  
*Ectocion collinus* Russell

Locality 11 is east of Cochrane, a rock cut on the Canadian Pacific Railway in legal subdivision 4, section 1, township 26, range 4, west of 5th meridian. Mammal teeth occur in a shell bed in soft sandstone, just above the upper limit of the talus. This shell bed is much more restricted now than formerly, evidently being in process of wearing away, like the bed at locality 2E. Bone fragments are still to be found among the shells, but only one identifiable tooth was discovered. The total list of identified specimens from locality 11 now stands as follows:

*Ectypodus cochraneensis* (Russell)  
*Ectypodus?* sp.  
*Ptilodus?* sp.  
*Diacodon septentrionalis* Russell  
*Diacodon* cf. *alticuspis* Cope  
*Leptacodon* sp.  
 Mixodectid?  
*Chriacus orthogonius* Russell  
*Meniscotherium semicingulatum* Russell

The age of the Paskapoo mammalian fauna has been generally accepted as Late Paleocene. This was clearly established by Simpson (1927) for the Erickson's Landing faunule and later confirmed by the discovery of the Paskapoo genus *Elpidophorus* in the Tiffanian of Montana (Simpson, 1936). In the meantime I had described faunules from Calgary and Cochrane as showing a mixture of Tiffanian and Clarkforkian affinities. Thus the mammalian fauna of the Paskapoo was entirely assigned to the Upper Paleocene. Nevertheless, it had seemed as if such a very thick sequence of strata, especially on the western side where a Cretaceous-Tertiary unconformity may be absent, should represent more than just one division of Paleocene time. This view was supported by the discovery of a tooth of *Pantolambda* sp. (Russell, 1948) in the Saunders Creek area of the foothills.

With the additional specimens here recorded, it seems desirable to review the age assignments of the Calgary and Cochrane localities. For the latter there seems little reason to modify the earlier conclusion. The only addition to the Cochrane faunules is *Leptacodon* sp. at locality 11. This genus is known from the Upper and Middle Paleocene. The new finds at Calgary are more significant. *Pronothodectes* is known previously from the Middle Paleocene of Montana. *Tetraclanodon* is almost an index

genus for the Middle Paleocene, although Simpson (1937B, p. 250) tentatively reported teeth of this genus from the Upper Paleocene of Montana. In contrast to these Middle Paleocene elements, locality 2E has also yielded *Catopsalis*, a characteristic Upper Paleocene multituberculate. Also, the species of *Ectypodus* appears to be the same as that in the Cochrane faunules. This apparent conflict of evidence would probably be resolved if good specimens were available, but there does seem to be support for considering the locality 2E faunule to be slightly older than the Cochrane faunules, and more or less intermediate between the typical Tiffanian and typical Torrejonian. This suggestion does not conflict with available stratigraphical evidence.

#### Order MULTITUBERCULATA

#### Family Ptilodontidae

#### *Ectypodus cochransensis* (Russell)

#### Plate I, figures 1, 2

*Ptilodus cochransensis*, Russell, 1929, pp. 172, 173, fig. 1; *Ectypodus cochransensis*, Russell, 1932, pp. 49-51, figs. 1-5.

*Type.* No. 129, Department of Geology, University of Alberta.

*Referred specimens.* Nat. Mus., Canada No. 9104, a left  $P_4$ , a little imperfect; Nat. Mus., Canada, No. 9111, an incomplete right  $P_4$ ; both from locality 2E, Calgary.

*Remarks.* The two new specimens agree in size and general features with the holotype of this species. The anterior re-entrant for  $P_3$  is a trifle more pronounced, and there are 15 serrations on the cutting edge, but these differences are not considered to be of specific value. The length of No. 9104 is 5.6 mm.

#### *Parectypodus?* sp.

#### Plate I, figure 3

*Referred specimen.* Nat. Mus., Canada, No. 9103, a lightly imperfect right  $P_4$ , from locality 2E, Calgary.

*Remarks.* This is a small tooth with a peculiar low outline. The anterior margin is straight with an oblique anterodorsal direction. The cutting margin is very gently convex with 9 or possibly 10 serrations. The absence of a re-entrant for  $P_3$ , the low cutting edge, and the small number of serrations suggest *Parectypodus tardus* Jepsen (1930A, p. 121) and ?*Parectypodus jepseni* Simpson (1937B, p. 102). Length of No. 9103 is 2.7 mm, which is smaller than that of the  $P_4$  in the two above-mentioned species. *P. tardus* is from the Willwood formation (lowest Eocene) and ?*P. jepseni* is from the upper Lebo (Middle Paleocene), so that the present occurrence falls within the presumed range of the genus.



## Order INSECTIVORA

## Family Leptictidae

*Leptacodon* sp.

Plate I, figures 4, 5

*Referred specimen.* Nat. Mus., Canada, No. 9098, a right  $M_1$  or  $M_2$  with damaged metaconid; locality 11, Cochrane.

*Remarks.* This minute lower molar is referred to *Leptacodon* because of the small size, the rather low trigonid (for a leptictid), the internally located paraconid, and the relatively wide talonid. A specific determination is more difficult. Five species of *Leptacodon* have been described: *L. tener* Matthew and Granger (1921; Simpson, 1935A), from the Tiffany fauna; *L. packi* Jepsen (1930B), from the Silver Coulee fauna; *L. ladae* and *L. munusculum* of Simpson (1935C, 1937B) from the Gidley Quarry fauna; *L. (Leipsanolestes) siegfriedti* (Simpson) (1928, 1929B), from the Bear Creek fauna. In size the Paskapoo tooth agrees with the  $M_1$  of *L. munusculum*, and is little if any smaller than lower molars of *L. tener* and *L. packi*. It is distinctly smaller than corresponding teeth of *L. ladae* and *L. siegfriedti*. Structurally, the closest resemblance seems to be to the  $M_2$  of *L. ladae*; this appears in the degree of elevation of the trigonid, the closeness of the paraconid to the metaconid, and in the relative width of the talonid. The differences between the various species, however, are so small, and the range of variation is so little known, that it is better not to attempt a specific identification of the Paskapoo tooth at this time. Length of No. 9098 is 1.2 mm. and width is 0.7 mm.

## Order PRIMATES

## Family Plesiadapidae

*Pronothodectes* sp.

Plate I, figures 6, 7

*Referred specimen.* Nat. Mus., Canada, No. 9107, a left lower molar,  $M_1$  or  $M_2$ , from locality 2E, Calgary.

*Remarks.* The single tooth referred to above is clearly plesiadapid, as shown by the high, forwardly leaning trigonid, associated with a wide, low talonid. It is referred to *Pronothodectes*, rather than to *Plesiadapis*, on the basis of the following features: cusps of trigonid conoid, with connecting crests poorly developed; paraconid almost as large as protoconid; hypostylid on anterior arm of hypoconid vestigial; hypoconulid small but distinct; entoconid conoid; external cingulum confined to anteroexternal face of trigonid. The resemblance of this tooth to the  $M_1$  and  $M_2$  of *Pronothodectes matthewi* Gidley (1923, p. 12) is very close, both in structure and absolute size, but the width of the tooth is much less, giving a length to width ratio of 1.3 instead of 0.95 as for *P. matthewi* (Simpson, 1937B, p. 167). Length of the Paskapoo tooth is 2.1 mm. and width is 1.6 mm.



Simpson (1927) described isolated upper and lower teeth of *Nothodectes* [= *Plesiadapis*] cf. *gidleyi* Matthew from the Paskapoo of Erickson's Landing, east of Red Deer, Alberta. Some of these teeth resemble Nat. Mus., Canada No. 9107, notably AM 15543 H. However, the lower molars from Erickson's Landing are larger than the Calgary specimen and have the paraconid more reduced and the anterior crest from the hypoconid better developed. These differences suggest that the Erickson's Landing teeth truly represent *Plesiadapis*, whereas the Calgary specimen belongs to *Pronothodectes*.

The history, distribution, and relationships of the Plesiadapidae have been discussed by Teilhard de Chardin (1916-1921), Jepsen (1930B), and Simpson (1935A, 1937B).

#### Order CONDYLARTHRA

#### Family Phenacodontidae

#### *Tetraclaenodon* cf. *puercensis* (Cope)

#### Plate I, figure 8

*Referred specimen.* Nat. Mus., Canada, No. 9105, left lower molar, M<sub>1</sub> or M<sub>2</sub>, from locality 2E, Calgary.

*Remarks.* This low, bunodont, rectangular molar is obviously phenacodont, but its identification as *Tetraclaenodon* rather than *Ectocion* or *Phenacodus* is surprising in view of the generally Tiffanian aspect of the Paskapoo fauna (see above). This identification is based on the presence of a distinct, internally situated paraconid, of a curving crest from protoconid to paraconid, and of finely wrinkled enamel. The dimensions fall within those of the M<sub>1</sub> and M<sub>2</sub> of *Tetraclaenodon puercensis* (Cope) and are distinctly greater than those of *T. pliciferus* (Cope) and *T. symbolicus* Gidley.

*Tetraclaenodon* is the characteristic phenacodont of the Middle Paleocene, but Simpson has recorded the probable occurrence of upper molars resembling those of *T. puercensis* from a high level in the Melville formation (Upper Paleocene of southwestern Montana). For further discussion of *Tetraclaenodon*, the reader is referred to Granger (1915), Simpson (1937B), and Matthew (1937).

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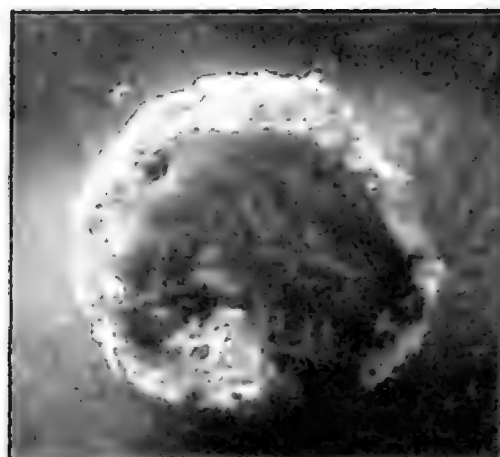
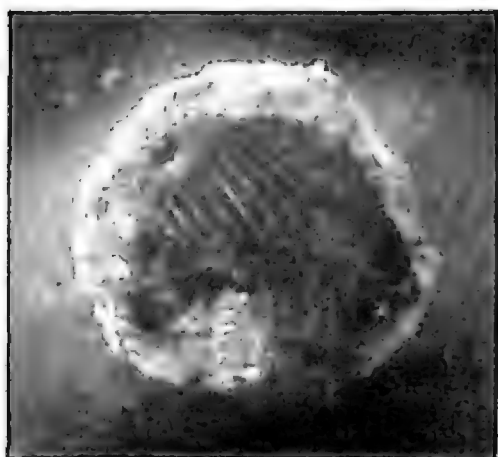
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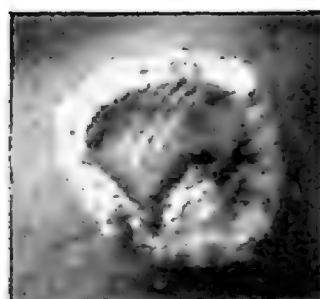
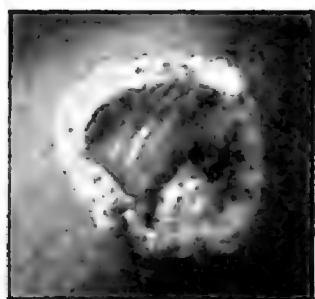
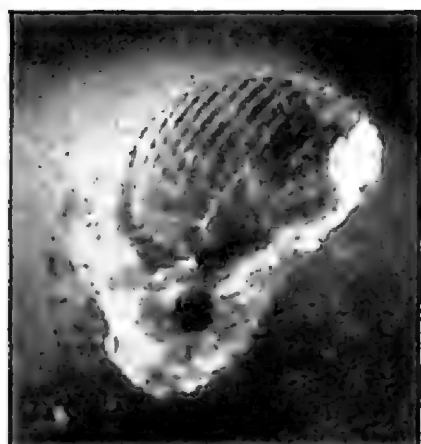
## PLATE I

(All figures in stereoscopic pairs)

- Figure 1. *Ectypodus cochranensis* (Russell), N.M.C. No. 9104, left P<sub>4</sub>, internal view, X 4.  
Figure 2. *Ectypodus cochranensis* (Russell), N.M.C. No. 9111, right P<sub>4</sub>, internal view, X 4.  
Figure 3. *Parectypodus?* sp., N.M.C. No. 9103, right P<sub>4</sub>, internal view, X 4.  
Figure 4. *Leptacodon* sp., N.M.C. No. 9098, right M<sub>1</sub> or M<sub>2</sub>, crown view, X 8.  
Figure 5. *Leptacodon* sp., N.M.C. No. 9098, external view, X 8.  
Figure 6. *Pronothodectes* sp., N.M.C. No. 9107, left M<sub>1</sub> or M<sub>2</sub>, crown view, X 4.  
Figure 7. *Pronothodectes* sp., N.M.C. No. 9107, external view, X 4.  
Figure 8. *Tetraclaenodon* cf. *puercensis* (Cope), N.M.C. No. 9105, left M<sub>1</sub> or M<sub>2</sub>, crown view, X 3.

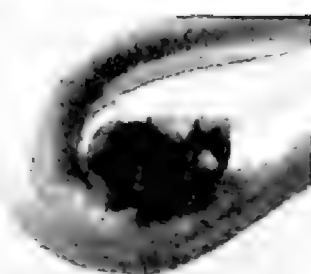
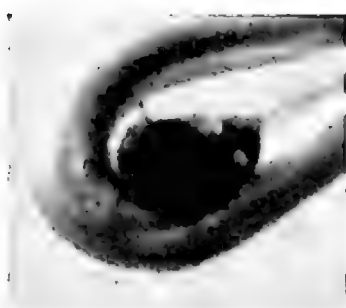


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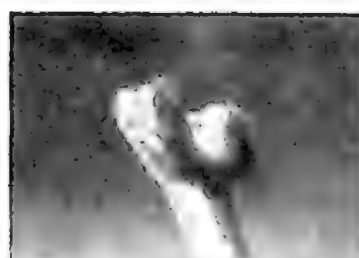
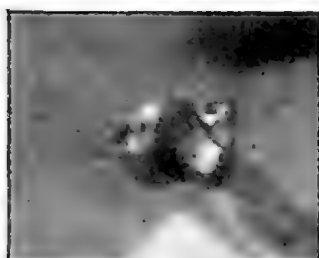
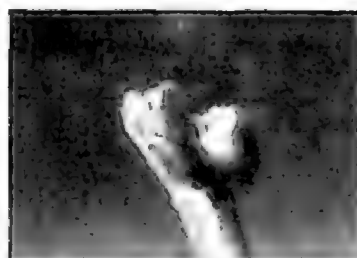
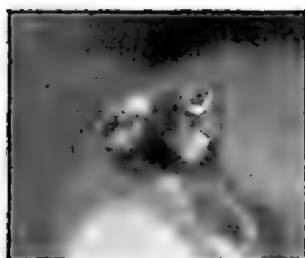
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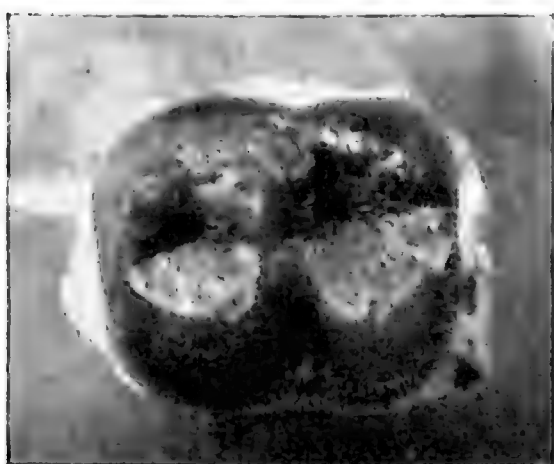
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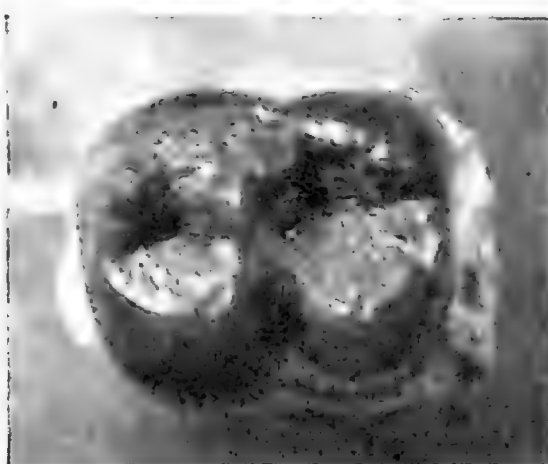


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## ECOLOGICAL INVESTIGATIONS ON SHORE INVERTEBRATES OF THE PACIFIC COAST OF CANADA, 1955

*By E. L. Bousfield*

During the period June 25 to September 6, 1955, a preliminary survey was made of the principal invertebrate animals of the shores of southern Vancouver Island, the islands of the Strait of Georgia, and the mainland of British Columbia. The present report provides a list of stations visited, hydrographical data obtained, and general observations made on marine ecological conditions and shore biota of the region.

The intertidal fauna of the Vancouver Island region of the Canadian Pacific Coast has been fairly intensively studied and on the whole is probably better known than that of equivalent areas of the Canadian Atlantic Coast. In "Between Pacific Tides", Ricketts and Calvin (1952) have provided a well-documented description of the distribution and intertidal ecology of the principal invertebrate species of seashores from Alaska to Lower California. Such information is particularly detailed for well-studied groups such as the hydroids, nemerteans, polychaetes, pycnogonids, most of the crustaceans, molluscs, echinoderms, and tunicates, in well-studied habitats such as rocky, sandy, and muddy beaches of the highly saline outer coast, and in well-studied regions such as southern Vancouver Island and Puget Sound. The present investigation therefore is concerned primarily with the collection and study of lesser known groups, particularly amphipod crustaceans and halophilic terrestrial arthropods, in relatively neglected habitats such as spray pools and drift-line debris, fresh-water beach seepages, and estuaries. Further investigations are planned for the virtually unstudied sea-shores of northern British Columbia, the Queen Charlotte Islands, and adjacent regions.

During the present investigation, hydrographical observations and collections were made at 63 localities, accessible by automobile, of which 50 were marine, 12 fresh-water, and one was terrestrial (Figure 1, and Table). A total of 163 lots containing approximately 11,000 specimens of macro marine organisms were taken, chiefly by means of a fine-mesh wire sieve (kitchen strainer) and by hand picking. A long-handled, medium-coarse net was used in scraping specimens from rocks and algae, below the low-water line on steep shores and on wharf pilings, and brought within hip-boot reach specimens otherwise obtainable only at minus tides and/or in very calm weather. The material was suitably preserved and subsequently sorted into major systematic groups. The amphipod, isopod, cumacean, and decapod crustaceans are presently being studied, and the results, largely taxonomical, are expected to appear later in detailed reports.

Eric L. Mills of Ottawa ably assisted in the field work. The writer is grateful to Dr. W. E. Ricker, Dr. John P. Tully, Terry Butler, Mr. and Mrs. E. Berkeley and others of the scientific staff of the Pacific Biological Station, Nanaimo, B.C., for helpful suggestions in various phases of the

work and for the loan of hydrographical equipment. The assistance and hospitality of Dr. and Mrs. G. Clifford Carl and I. E. Cornwall, Victoria; Mr. and Mrs. J. Moraes, Ucluelet; S. B. MacDonald, Powell River; and Dr. R. H. Fleming, Dr. R. I. Smith, and staff, members of the Friday Harbour Laboratories, University of Washington is also acknowledged.

#### LOCALITY DATA, VANCOUVER ISLAND REGION

Keys to station numbers:

P—Pacific coast of Vancouver Island

G—Strait of Georgia, Vancouver Island

F—Strait of Juan de Fuca region

M—B.C. Mainland.

Sta. No.	Date	Locality	Habitat	Water temp. (°C.)	Water sal'y (‰)
P1	Aug. 6	Clayoquot I., Clayoquot Sound	Sandspit, NW. end brackish stream	—	—
P2	" 6	Tofino and Usatzes Pt., Browning Passage, Clayoquot Sound	Wharf pilings, rocky intertidal; sand and mud at LW line	13.5°	27.6
P3	" 6	Browning Passage 4 miles above Usatzes Pt.	Mud flats, at mid-tide level	—	—
P4	" 5	Long Beach, NW end near Box I., Wickaninnish B.	Sand flats and rocks; stream outlet. LW-HW	12.5	31.3
P5	" 2	Long Beach, NW. end Wickaninnish B.	Rock pools at and above HW mark	warm	2 layered brackish
P6a	" 2	Long Beach, SE. and Moraes Beach. Wickaninnish B.	Sand beach, LW-HW line under debris	12.4	31.0
P6b	" 3	Long Beach, SW. end. Webb's rocky point	Rocky shore; salt water pools, under fucoids, LW-MW level	12.0	31.6
P6c	" 3	Long Beach, SE. Webb's rocky point	Brackish pools at and above HW	warm	0-10
P7	" 4	Bay just N. of Quisitis Pt.	Rocks, boulders, and gravel beach of protected bay; dense kelp beds	12.2	31.2
P8	" 8	Wreck Bay, NW. end. ....	Sand pools, boulders, mouth of stream; intertidal	—	low brackish
P9	" 7	Cove ½ mi. N. of Amphitrite Pt	Rocks, boulders, and organic sand at bay head at LW line	13.0	30.7
P10	" 7	Kennedy L., SE. shore....	Wave washed stones and gravel and driftwood	18.9	fresh water
F1	" 17	Whiffen Spit, Sooke Basin	Boulder and sandy pebbles, kelp and eel grass; mainly at LW line	10.9	31.3
F2a	" 18	William Head, outer bluff	Rocky bluff; tidal pools LW-HW	—	—
F2b	" 18	Bentinek I., inner shore..	Algae covered boulders at LW	9.7	31.7
F3	" 16	Witty's Lagoon, outer shore	Sand, sandy gravel, and rock; mouth of brackish lagoon, LW-HW	11.1	30.5
F4a	" 14	Albert Head, N. side.....	Sandy gravel beach; steep rock and boulder shore, mainly LW line	10.3	29.9
F4b	" 14	Lagoon W. of Esquimalt Hbr.	Sandy gravel bar at lagoon mouth, HW	—	—
F5	" 20	Victoria breakwater; outer side near shore	Solid granite blocks at LW tidal pools	10.1	31.0
F6a	" 15	Telegraph B., Victoria....	Boulders, mud, and algae at LW line	11.7	28.5
F6b	" 15	Cadboro B., Victoria.....	Sandy bottom covered with dead <i>Ulva</i> ; HW line	—	—

## LOCALITY DATA, VANCOUVER ISLAND REGION—Continued

Sta. No.	Date	Locality	Habitat	Water temp. (°C.)	Water sal'y (‰)
F7	July 21	Friday Hbr., Biol. Sta., San Juan I.	Surface, off wharf (night light)	cold	?
F8	" 21	Garrison B., San Juan I.	Mud flats at LW; Salicornia marsh at HW	cold 11.0	about 28.0
F9	Aug. 19	Sidney I., sand spit, NW. end	Sandy mud and eel grass below LW line; sandy beach at HW line	15.7	29.0
F10	" 20	Goldstream estuary, head of Finlayson Arm	Stony and mud bottom at head of estuary	17	fresh to med. brackish
F11	" 21	Shawnigan Lake, NW. shore	Algae - covered stones, wood debris	20.3	fresh water
F12	July 11	Ediz Hook, Port Angeles, Washington	Coarse sand and gravel bar at HW line	—	—
G1	Aug. 2	Menzies B., Bloedel, V.I.	Stony shore, HW line....	12.5	25.8
G2	" 13	Campbell R. breakwater outer side near shore	Rocks and algae at LW line, sandy mud bottom	—	—
G3	" 12	Miracle Beach, Oyster R.	Sand and pebble beach; HW line	—	—
G4a	" 12	Cape Lazo, Comox, B.C.	Boulders and stones at base of sand cliff, LW-HW levels	14.7	24.9
G4b	" 12	Kyle B., NW. Cape Lazo.	Sandy beach at HW line.	—	—
G5	" 12	Head of Comox Bay.....	Small creek, mud flats, and wood debris	warm	brackish
G6	" 11	Horne L., western end....	Small stream at mouth of cave, ¼ mile above lake	8.1	fresh water
G7	July 24	Cameron R., 4 miles above Cameron L.	Rocky bottom, rapids....	12.0	fresh water
G8	" 24	Cameron L., SE. end.....	Rocky shore.....	—	fresh water
G9	" 24	Qualicum Beach.....	Stony and sandy spit; HW	19.4	—
G10	" 28	Parksville, V.I.....	Sand and gravel flats, LW to HW levels	15.0	18.6
G11	" 30	Cottam Pt., V.I.....	Steep rocky shore, HW-LW	14.8	18.6
G12	" 27	Nanoose B., head.....	Mouth of stream; sand, gravel, and shingle; LW to HW levels	16.1	24.1
G13	" 8	Piper's Lagoon, Neck Pt.	Sandy mud flats; shelly bottom of lagoon mouth	17.1	17.5
G14	" 25	Berkeley Stream, at Biol. Sta.	Steep boulder bottom.....	12.5	fresh water
G15	" 25	Keighley's stream, west of Biol. Sta.	Mud and decaying algae, at and above HW line	about 16.0	0 to 5
G16	" 8	Lost Lake, NW. of Biol. Sta.	Rocky and muddy shore, cold seepage inflow	pond abt 15.0	fresh water
G17	" 27	Diver L.....	Quaking bog margin, wood ships, detritus	15.0	fresh water
G18	" 27	Millstream, 3 mi. above Nanaimo	Stony riffles.....	16.5	fresh water
G19	" 29	First Nanaimo L.....	Muddy and boggy margin, sedges, and rushes, wood debris	16.0	fresh water
G20	" 9	False Narrows, Gabriola I.	Slate beaches and boulders; LW	15.8	16.4
G21	" 23	Head of Ladysmith Hbr., mouth of creek	Mud flats, stony bottom, wharf pilings; HW-LW	27.5	24.1
G22	" 29	Chemainus Bay, mouth of Chemainus R.	Sandy mud flats, salt marsh, LW-HW	15.7	23.1
M1a	Aug. 26	Savary I., N. side.....	Coarse sandy bottom; eel grass, LW	14.2	25.2
M1b	" 26	Mittlenatch I., south side	Rocky shore, tide pools, LW-HW	—	—



LOCALITY DATA, VANCOUVER ISLAND REGION—*Concluded*

Sta. No.	Date	Locality	Habitat	Water temp.	Water sal'y
				(°C.)	‰
M1c	" 26	Savary I., south side.....	Coarse sand and pebbles with boulders at base of sand cliffs; HW-LW	15.0	25.0
M2	" 25	Emmond's Beach, 10 miles N. of Powell R.	Steep rock and pebble beach; HW-LW. F.W. seepage locally	13.7	25.4
M3	" 27	Kelly B., at river mouth.	Sand, boulders, LW-HW.	15.2	16.2
M4	" 28	Pond at head of Porpoise B., Sechelt, B.C.	Mud, rooted aquatics, wood debris, near HW level	warm	5-10
M5	" 28	Selma Park, Sechelt, B.C.	Rocky headland, gravel; LW-HW	16.7	16.0
M6	July 6	Deep Cove, Indian Arm, Burrard Inlet	Stones, pebbles, below steep rocky cliff, mouth of F.W. brook	abt. 17.0	16.0
M7	Aug. 23	Beaver L., Stanley Park, Vancouver	Sticks, sand and stony bottom, mostly rapids	8.4-10.2	fresh water
M8	July 5	Spanish Banks, Pt. Grey, Vancouver	Muddy sand flats; boulders; LW-HW	abt. 16.0	0-15
M9	Aug. 23	Sunset Nursery, Vancouver City Parks	Under boards, flower pots, and rubble in greenhouse	—	—
M10	" 27	Pt. Roberts, Washington, west side	Boulders, muddy sand, gravel, algae, LW-HW levels	16.4	9.1
M11	" 30	White Rock, B.C.....	Stone breakwater, muddy sand shore; LW-HW	18.0	15.2

## GENERAL OBSERVATIONS

## 1. Hydrography

The present limited hydrographical observations (*See Table*) conform essentially with the summer oceanography of the Vancouver Island region depicted by Tully, Hollister, Pickard, Waldichuk, Tabata, and others (Progress Reports of Pacific Coast Stations, Fisheries Research Board of Canada, Nos. 93-105, 1949-55). Three main types of coastal marine areas have been recognized: (1) open coastal seas (i.e. the outer Pacific Coast), (2) protected coastal seas (i.e. Strait of Georgia), and (3) turbulent channels (i.e. Strait of Juan de Fuca). Numerous long narrow inlets or fiords characteristic of the coast of British Columbia are a special type of protected coastal sea.

Shore waters of the outer coast are of year-round high salinity (30-32 ‰) and of moderate annual temperature range (6-14°C.). The Strait of Georgia is an inland sea dominated hydrographically by the outflow of the Fraser River. The circulation is essentially tidal, with a rise of tide above datum of 14 to 16 feet. On it is superimposed a counter-clockwise residual flow (northward along the mainland side and southward along the island shore) set up by winds and river discharge under the influence of the earth's rotation. Seasonal fluctuations in salinity and temperature are large. Coincident with the Fraser freshet and intense solar heating in June and July, surface salinities in the Strait fall from a winter average of



20 to 28 ‰ to 6 to 25 ‰ and temperatures rise from 5 to 8°C. to 15 to 20°C. An inshore salinity of 9.8 ‰ at station M10 and an extreme temperature of 27.5°C. at station G21 were measured (*See Table*).

The Strait of Juan de Fuca is characterized by very strong tidal currents and counter-clockwise circulation. In this region the thin layer of relatively warm brackish surface water moving seaward from the Strait of Georgia is thoroughly mixed with the much greater volume of landward moving cold salt water beneath. Thus the annual range of surface salinity and temperature is very narrow (30–32.5 ‰ and 7 to 12°C. respectively).

## 2. Shore Characteristics and Faunal Composition

In common with the open coastal sea, the shores of the turbulent channels are exposed to heavy ocean breakers and a range at spring tides of 12 to 14 feet. The shores of the Strait of Georgia, however, are protected from the powerful ocean surf by islands and narrow passages at either end. Also, the tidal range is greater (17–19 feet at higher HW) and is diurnal in type, with one pronounced low tide and a prolonged stand at HW during the day.

The beaches of the exposed and turbulent regions may be grouped in four main categories: (1) exposed rocky shores, (2) boulder and gravel bayhead shores, (3) smooth, flat, sandy beaches of bayheads and lagoon spits, and (4) high salinity mud flats and salt marshes. The tidal zone has been variously subdivided bathymetrically on the basis of tidal levels and biotic communities. The degree of development of the subzones depends chiefly on the amount of tidal rise and fall, the amount of wave action, and the slope of the shore. Stephenson *et al.* (1949) have given a universally applicable definition of the littoral zone as that region between extreme low water and the upper limit of marine organisms, below and above which are the infralittoral and supralittoral zones respectively. In Ricketts and Calvin (1952) the American-Pacific littoral zone has been subdivided into the demersal, the lower intertidal, the upper intertidal, and the splash zones, below and above which are the subtidal and supratidal zones respectively. This system has been found generally applicable to, and very useful in, the present studies on the shores of the Vancouver Island region.

The rocky headlands of the outer coast of Vancouver Island consist mainly of relatively hard volcanic and metamorphic rocks. According to the amount of wave action, rocks of a given type may be coarse and irregular or smooth and worn, and are moderately to steeply sloped. When the tide is out, pools remain at all levels; the pools may be deeply scoured by stones and gravel in the lower intertidal, relatively unmarked and stable in the upper intertidal, and frequently stagnant and low-brackish (<5 ‰ in the spray zone.) Abundant marine algae are fixed to the substratum and range in size from the large demersal *Nereocystus*, *Laminaria*, *Polstelsia*, and the false eel-grass *Phyllospadix* (a rooted aquatic), through *Egregia* and *Iridophycus*, *Fucus* and *Pelvetia* of the mid-littoral region, to the minute *Prasiola* of the splash zone.

Conspicuous among a host of invertebrates in the demersal zone are sea-urchins (*Strongylocentrotus purpuratus*), bat-starfish (*Patiri aminata*), chitons (*Katherina tunicata*, *Mopalia* spp.), and top shells (*Calliostoma*

*annulatum*), among which crawl and swim large decapod shrimps (*Pandalus danae*), crabs (*Pugettia gracilis*, *P. producta*, *Scyra acutifrons*), amphipods (*Amphithoe humeralis*, *Parapleustes pugettensis*), pycnogonids (*Lecythorhynchus* sp.), and nudibranch molluscs (*Anisodoris nobilis*). Living in the *Mytilus californianus*-*Balanus cariosus*-*Mitella polymerus* association of the lower and upper intertidal are encrusting sponges (*Ophlitaspongia pennata*), sea anemones (*Bunodactis elegantissima*), polychaetes (*Nereis vexillosa*), isopods (*Idothea urotoma*), amphipods (*Hyale frequens*, *Melita* spp.), decapods (*Hemigrapsus nudus*, *Pagurus granosimanus*), chitons (*Nuttalina* sp.), limpets (*Acmaea scutum*) snails (*Tegula funebris*), and nudibranchs (*Diaulula* sp.). Lower salt pools contain the actively swimming *Acanthomysis sculpta*, *Amphithoe simulans*, several species of *Spirontocaris*, and clinging caprellid amphipods, whereas spray pools at the HW level harbour the polyclad worm *Leptoplana acticola*, the polychaeta *Cirriiformia* sp., the large banded amphipod *Hyale pugettensis*, and the small greenish *Anisogammarus ramellus*, the barnacles *Chthamalus dalli* and *Balanus glandula*, and a large *Cryptochiton*. Among insects, spiders, myriapods, and other terrestrial arthropods of the drift-line, is commonly found the shore hopper *Orchestia traskiana*. The sowbug *Ligyda pallasii* and an unidentified Thysanuran scurry over the upper rocks at low water.

The boulder and gravel bayhead shores are formed by storm waves. The constant abrasion of stone upon stone has all but denuded them of attached macroalgae, barnacles, and mussels. A few of the more tenacious forms may be found on the larger boulders, and limpets (*Acmaea fenestrata*) and littorines browse on their slimy surfaces. Under larger stones and in crevices are found the porcelain crab *Petrolisthes cinctipes*, *Hemigrapsus nudus*, the nemertean *Amphiporus* sp., the polychaete *Thelepus cincinnatus*, the isopod *Cirolana harfordi*, and the tunicate *Clavelina*.

The outer sandy beaches (Plate I) are smooth, wave-deposited expanses of fine sand, often several miles in length and 50 to 200 yards in width at low water. Under the action of wind and waves, the sandy substratum is continually shifting and is thus completely devoid of attached plants and animals. Most of the sand-dwellers are burrowing forms that include the razor clam *Siliqua patula*, the lugworm *Arenicola* sp., and the polychaetes *Thoracophelia mucronata* and *Nephtys californiensis*. Species actively moving inshore and out again with the tide include *Cancer magister*, *Crago nigricauda*, *Archaeomysis grebnitzkii*, *Cirolana* sp., and in sandy fresh-water seepages and stream outflows are the amphipods *Pontharpinia milleri* and *Haustorius washingtonianus*. Burrowing deeply in the upper sands by day and actively hopping about by night are the great beach hopper *Orchestoidea californiana* and a smaller, undescribed relative.

High-salinity mud flats and salt marshes at the heads of protected bays and lagoons are to a considerable extent exposed at low water. The dominant invertebrates are burrowers such as the polychaete *Hemipodus borealis*, the sipunculid *Phascolosoma*, the mud shrimps *Callinassa californiensis* and *Upogebia pugettensis*, the geoduck *Panope generosa*, the horse clam *Schizothaerus nuttalli*, and the bent nose clam *Macoma nasuta*. In muddy pools and small saline creeks are the amphipods *Anisogammarus pugettensis* and *Corophium* spp., *Hemigrapsus oregonensis*, *Neomysis rayi*,



and in rotting algae the leptostracan *Epinebalia pugettensis*. On protruding rocks and stakes are found *Acmaea persona* and *Littorina sitkana*, and among the *Salicornia* at the HW line is the minute nudibranch *Alderia modesta*.

In the protected coastal region three main types of beaches are recognizable: (1) rocky shores, (2) gravel and sand flats, (3) brackish mud flats. The rocky shores are physically similar to those of the outer coast. In the Nanaimo region the slope is moderate but along the almost beachless walls of the fiords (e.g. Indian Arm) the slope is precipitous. The soft sandstone shores of southeastern Vancouver Island are strikingly eroded near the HW line. Wave action at this level is unusually severe owing to the prolonged diurnal stand at HW and to the nearly uniform level of successive high tides in the region. Many of the attached algae of the outer coast are absent from the protected shores, particularly near the Fraser estuary. *Laminaria*, *Fucus*, *Ulva*, and *Enteromorpha* dominate the shores from the demersal to the upper intertidal respectively. The principal sessile invertebrate facies at mid-tide level is the *Balanus glandula*-*Mytilus edulis* association. Many of the common rock forms of the outer coast are absent here, but in the lower intertidal occurs the large purple starfish *Pisaster ochraceus confertus*, the sea urchin *Strongylocentrotus drobachiensis*, and the worm-like *Phoronis vancouverensis*, and at various levels are found *Acmaea cassis*, *Littorina sitkana*, and *Hemigrapsus oregonensis*. Actively crawling or swimming among the fucoids are the shrimps *Hippolyte clarki*, *Spirontocaris* spp., the amphipods *Hyale plumulosus* and *Caprella* spp., and the isopods *Pentidotea resecata* and *Idothea urotoma*.

The gravel and sand flats are best developed among the wave-eroded glacial deposits of the northwestern part of the Strait of Georgia (e.g. Cape Lazo and Savary Island). The flats exhibit a progressive change from almost pure sand (containing a little silt) at the demersal and low-tide level, through gravelly sand and stones at mid-tide, to pebbles, stones, and boulders in the upper intertidal and splash zones. Beds of short eel-grass (*Zostera*) occur in the lower sandy portion. The dominant burrowing forms are the bivalves *Saxidomus giganteus* and *Clinocardium nuttalli*, the amphipods *Pontharpinia milleri* and *Ampelisca* sp., the shrimp *Crago nigricauda*, the cumacean *Lamprops krasheninnikova*, the sand dollar *Dendraster excentricus*, the polychaete *Axiiothella rubrocincta*, and the anemone *Evactis artemisia*. In fresh-water seepages near the high-water line may be found the amphipods *Haustorius washingtonianus* and *Paramoera mohri*. Burrowing in and under the drift-line debris are the beach hopper *Orchestoidea pugettensis*, an undescribed *Orchestia*, and the widespread *O. traskiana*.

The brackish mud flats are formed largely of river-borne silt in bays and estuaries of the entire Strait of Georgia. The mud is frequently mixed with sand and/or bivalve shells and overgrown with *Zostera* in the lower intertidal and with sedges and marsh grasses in the upper intertidal. Dense beds of *Mytilus edulis* and *Crassostrea gigas* (some *Ostrea lurida*), on which grow the barnacle *Balanus glandula* and associated epifaunas, are exposed at low water. Dominant burrowers are the bivalves *Mya arenaria*, *Macoma nasuta*, *Tapes philippinarum*, and *Protothaca staminea*, the snails *Nassarius* and *Cerithidea*, the polychaete *Arenicola*, and the

mud shrimp *Upogebia pugettensis*. Abundantly found in the most landward and freshest water of the estuarine flats are *Hemigrapsus oregonensis* (which scuttles into burrows at the tremor of approaching footsteps), the amphipods *Anisogammarus confervicolus*, *Corophium spinicorne*, and *Melita* sp., the isopod *Exosphaeroma oregonensis*, the opossum shrimp *Neomysis mercedis*, and the polychaete *Nereis japonica*.

### GENERAL CONCLUSIONS

The Canadian Pacific shore fauna is exceedingly rich in numbers of species and individuals. The number of species per genus and family group is three or more times that of comparable shores of the Canadian Atlantic Coast. For example, among the prominent and dominant groups in which the relationship holds, may be cited the limpets (*Acmaea*), chitons (*Lepidochiton*), whelks (*Thais*), barnacles (*Balanus*), shrimps ("Spirontocaris", *Crago*), crabs (*Cancer*), isopods (*Idothea*), amphipods (*Amphithoe*, *Hyale*, *Caprella*), mysids (*Neomysis*), and echinoderms (*Leptasterias*, *Strongylocentrotus*). Several conspicuous groups on the Pacific Coast such as the snails *Tegula*, *Olivella*, and *Haliotis*; barnacles *Mitella* and *Chthamalus*; crabs *Hemigrapsus*, *Oregonia*, *Petrolisthes*, and *Pugettia*; mud shrimps *Callinassa* and *Upogebia*; and the isopod *Exosphaeroma* are lacking, and their niches in many cases unfilled on the Canadian Atlantic Coast. Examples of the reverse case are much fewer, among which are the lobster *Homarus*, the amphipod *Marinogammarus*, and the king crab *Limulus*. The Pacific intertidal is more densely crowded with individuals, particularly in more exposed situations such as the wave shock zone and the outer faces of rocks and boulders, and in pools of the upper littoral and splash zones. Among the Pacific intertidal organisms, often in exposed positions, are many species that are large, measurably and relatively (within their respective groups), a fact previously noted by Stephenson *et al.* (1954). Examples are the algae *Egregia* and *Iridophycus*; the polyclad worm *Leptoplana acticola*; the nemertean *Cerebratulus*; the polychaete *Neanthes brandti*; the anemone *Bunodactis xanthogrammica*; the starfish *Pisaster ochraceus* and *P. giganteus*; the shrimp *Pandalus danae*; the barnacles *Balanus nubilus*, *B. cariosus*; and the bivalve *Panope generosa*. Also, on the Pacific Coast is a much greater frequency of symbiotic, commensal, and parasitic species such as the sponge *Ectyodoryx parasitica*; the polychaete *Arctonoe*; the pea crabs *Fabia* and *Pinnixa*; the isopod *Argeia*; and the rhizocephalan cirripede *Peltogaster*.

The principal factors contributing to the wealth of species are probably (1) the moderate annual range of water temperature (well above freezing in winter, cool in summer) and (2) the nutrient-rich waters derived from large rivers and from deep upwelling and landward moving ocean water. The extensive development of intertidal communities at all levels is probably attributable to a more favourable physical environment, viz: (1) the lack of ice-action along the shores in winter, (2) the absence of daily and annual extremes of air temperature, reflecting the high proportion of foggy, overcast, and rainy periods, (3) the prevalence of onshore winds and booming surf that combine to saturate upper levels with salt spray, and (4) the



occurrence of tides of fairly large and relatively constant amplitudes. The further development of these relationships will be the subject of future investigations in the region.

The Canadian Pacific shore invertebrates appear separable into three zoogeographical and ecological groups: (1) cold-temperate (boreal) stenothermal and stenohaline forms of the outer coast, (2) the reproductively warm-stenothermal brackish-water forms of the Strait of Georgia, and (3) the eurythermal, euryhaline (ubiquitous) pan-boreal species of both open coasts and protected bays and estuaries. Species characteristic of (1) e.g. *Mitella polymerus* and *Balanus cariosus*, range from southern Alaska to northern California; those of (2), e.g. *Hyale plumulosus*, *Orchestoidea corniculata*, *Anisogammarus confervicolus*, *Protothaca tenerrima*, *Crassostrea gigas*, *Lunatia lewisi*, and *Acteon punctocaelatus* have not been taken north of the Vancouver Island region but are found sporadically in bays and estuaries southward to lower California; and those of (3) such as *Nereis vexillosa*, *Mytilus californianus*, *Acmaea persona*, *Littorina scutulata*, *Hemigrapsus oregonensis*, *Balanus crenatus*, and *Orchestia traskiana* occur from southern Alaska to lower California.

Owing chiefly to the mountainous terrain and precipitous coastline, estuaries of the Canadian Pacific Coast are restricted to two basic types: (1) fiords and (2) sloughs and lagoons. The former are typically long, narrow, steep-sided, and very deep (>1,000 ft.). The drift circulation is a two-layered flow and consists of a thin, seaward-moving, surface film of cool glacial melt waters, sharply demarcated from the landward counter-flow of cold, salt, moderately well-oxygenated water beneath. The shore fauna at all intertidal levels is poor in species but rich in numbers of *Balanus glandula*, *Mytilus edulis*, *Hemigrapsus oregonensis*, and other hardy forms. Sloughs and lagoons are broad shallow inlets of mud or sandy mud. In many cases the bottom is completely exposed at low water and is coursed by small meandering streams. Burrowing and tube-building invertebrates are abundant. Many of the small coastal streams tumble directly onto the beaches or percolate through the gravel and boulder foreshore and lack definable estuaries. The Fraser River mouth and the Strait of Georgia may be regarded as a very large modified fiord-type estuary. The Pacific Coast lacks well-developed coastal plain estuaries typical of the Atlantic Coast. These are former river valleys subsequently drowned by rising sea-levels and are relatively shallow. In summer, both surface and bottom waters are relatively warm and brackish and less distinctly layered than that of fiords, and the circulation provides a mechanism for the retention of planktonic larvæ of reproductively warm-stenothermal endemic invertebrates (Bousfield, 1955).

Finally, the Pacific intertidal fauna is relatively rich in marine euryhaline species that invade the freshwater mouths of small coastal streams and pools and seepages near the drift line. Among these forms are the amphipod crustaceans *Anisogammarus* spp. (esp. *A. ramellus*), *Corophium spinicorne*, *Paramoera mohri*, and *Haustorius washingtonianus*; the isopod *Exosphaeroma oregonensis* subsp., the opossum shrimp *Neomysis mercedis*; and the polychaete *Nereis japonica*. From rain and wind-blown salt spray, coastal streams undoubtedly receive appreciable amounts of salts of marine

origin. The ionic content (chlorides, calcium salts, etc.) in such freshwaters is thus probably sufficiently high to permit the prolonged survival of these euryhaline forms.

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Long Beach, Vancouver Island

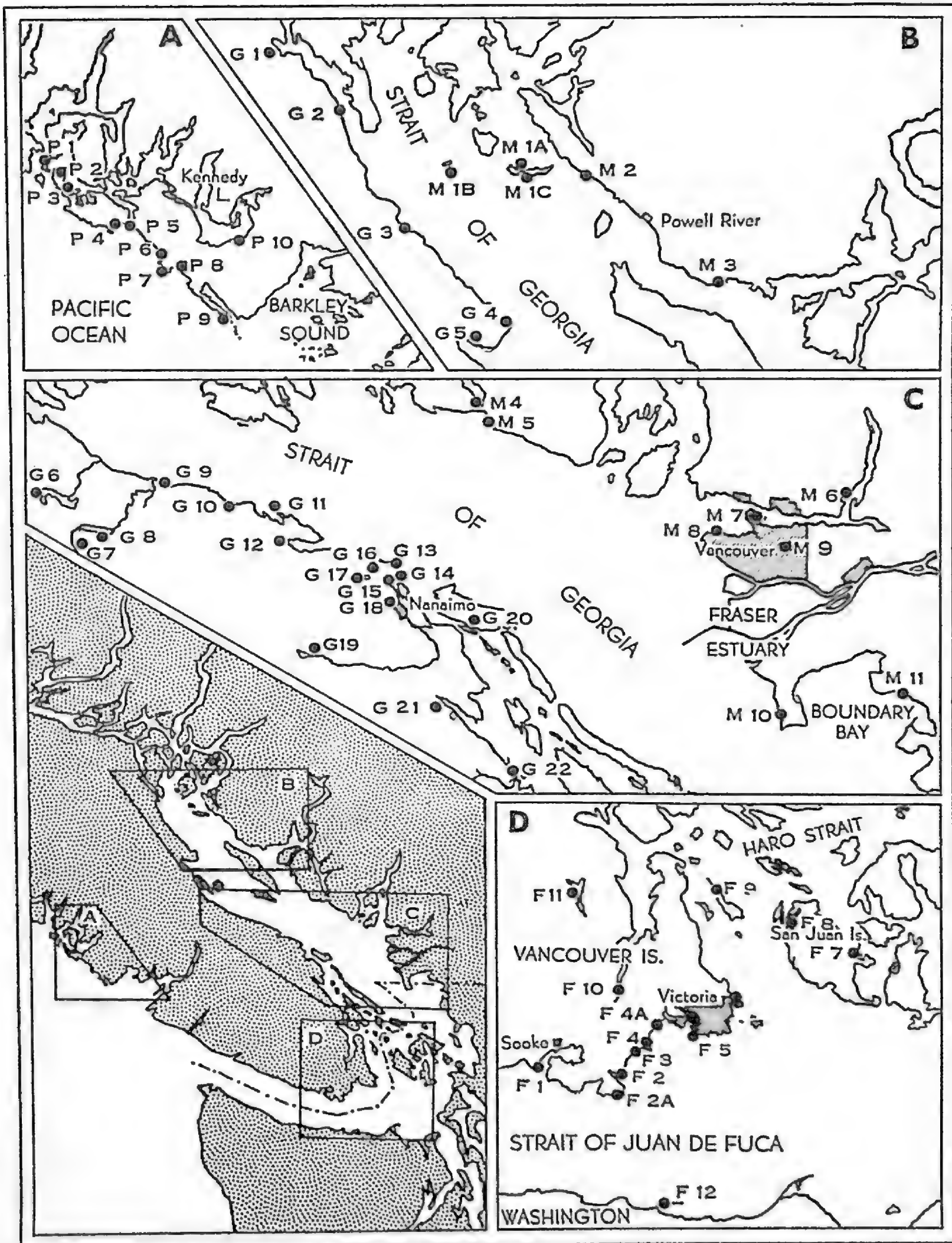


Figure 1. Collecting localities in the Vancouver Island region.



## CANADIAN BRYOLOGICAL NOTES. I.

By Howard A. Crum

The only comprehensive treatment of Canadian bryophytes presently available is the annotated list which John Macoun presented in his *Catalogue of Canadian Plants* over half a century ago (1892, 1902), and, needless to say, it is badly outmoded. By virtue of his zealous collections from many parts of Canada from the Atlantic to the Pacific, Macoun contributed more to Canadian bryology than any other person, either before or since. The specimens that he left behind at the National Museum of Canada are very numerous and, unfortunately, include a very large number of problems which were not adequately dealt with in the preparation of Grout's *Moss Flora of North America*, excellent and useful as that work is, and these problems must be resolved before any real understanding of the taxonomy and distribution of Canadian bryophytes can result.

The greatest confusion is to be found among the Musci. The present paper is the first of a series intended to elucidate many of the problems outstanding in Canadian bryology, many of which can be traced to the following reasons: Macoun sent most of his moss collections to N. C. Kindberg in Sweden for identification. Mr. Kindberg was notorious in his own time as a gifted but extremely careless worker. He had little knowledge of even the more common American mosses and apparently little or no pertinent literature, and a very inadequate herbarium. He described hundreds of new species, most of them quite spurious and many of them based on mixtures of species growing together or on several collections not at all referable to the same species. He never designated a type specimen and rarely gave enough information to identify the specimen or specimens examined. To compound the confusion, Macoun, no bryologist himself but certainly a clever observer, usually sent Kindberg representative series of specimens and named the remainder of his collections by comparison, without leaving a record of the specimens Kindberg had actually studied in duplicate. As a result, much of the material in the herbarium of the National Museum and widely distributed in other herbaria under Kindberg's names was actually determined by Macoun. It is for this reason that Kindberg's herbarium at the Naturhistoriska Riksmuseum at Stockholm is of prime importance to Canadian bryologists and also to the Americans because of considerable overlapping of floras.

*Dicranum jubulatum* Schimp. ex Jaeg., Ber. St. Gall. Naturw. Ges. 1871-72: 388. 1873.—Although *nomina nuda* have no nomenclatural status and for all practical purposes can be ignored, they are often prominent in the literature and cause considerable confusion. This one is listed in both Paris' *Index Muscorum* and Jaeger's *Adumbratio* but not mentioned elsewhere in the literature, so far as I can determine. There is a specimen at the New York Botanical Garden ("Winterinlet, Labrador, leg. Warmoë, 1857"); the material is very poor and scant, but it probably can be referred to *Anisothecium varium* (Hedw.) Mitt.

***Stegonia latifolia* var. *pilifera*** (Brid.) Broth.—Recently I received from Mrs. Fay A. MacFadden a Californian specimen of this moss which is exceedingly rare and not previously reported within the territorial limits of the United States in North America. Wareham (1939) recorded it only from the Yukon Territory and from the Rocky Mountains of Canada. It was distributed as *Weissia latifolia* Schwaegr. as No. 70 of Drummond's *Musci Americani* labelled merely as "Summit of mountains", presumably referring to the Rocky Mountains; Macoun (1892) also reported one of his own collections from "earth near Cache Creek, B.C.", but there is no specimen at the National Museum to authenticate his record. Steere (1948) also listed the variety from the Hayes Sound region of Ellesmere Island.

The California collection was made by Peter H. Raven on July 25, 1955, among rocks at 13,950 feet on Mount Barnard, Tulare Co. In 1955 Wm. A. Weber found it in Colorado at 12,000 feet on Mount Lincoln (*vide!*). These recent records indicate that this is a moss of arctic-montane distribution likely to be found more generally at very high altitudes throughout the Rocky Mountain system.

***Tortula bistratosa*** Flowers—Recently Mrs. Fay A. MacFadden sent a collection of this interesting and little known species made by G. N. Jones along the Milk River in Alberta, September 15, 1928, and originally distributed as *Desmatodon guepinii* BSG. This species, not previously known from Canada, has "the appearance of an undersized *Tortula ruralis* but with the leaves more erect to spreading but not squarrose, and in the dry state longitudinally infolded and incurved at the apex, not crisped or twisted" (Flowers, 1952) and is immediately recognized microscopically by its bistratose upper leaf cells which give the leaves a peculiar opacity. Flowers reported the species from Salt Lake, Tooele, Millard, Wayne, San Juan and Washington Counties in Utah and Mohave Co., Arizona. Recently I named a specimen from Yavapai County, Arizona (on verde limestone in desert, north of Cottonwood, *H. S. Haskell*, comm. Inez M. Haring) and another from Kern Co., California (granite boulders on Pinon Mountain near Red Rock Canyon, *L. F. Koch* 4039, comm. Koch).

***Grimmia torquata*** Hornsch.—Jones (1933) stated that *G. torquata* is rare and gave its distribution as "Alaska to California and Wyoming; Greenland; Europe", but I have seen well over one hundred different American collections of this beautiful and unmistakable species in the herbaria of the National Museum of Canada and the New York Botanical Garden and have found the range to include at least the following: southeastern Alaska, British Columbia, and the Yukon Territory, Washington, Idaho, Wyoming, Montana, and Colorado, California, Ontario, and Newfoundland, as well as Greenland and Iceland. Steere (1948) listed the species from Ellesmere Island also; Podpěra's *Conspectus Muscorum Europaeorum* also lists in its distribution the alpine and subalpine regions of central and northern Europe, the Svalbard Islands and the Faeroes, and I have seen material from Scotland, as well as many other European collections.

The interesting disjunct occurrence of this typically western American species in the Thunder Bay District of Ontario and in Newfoundland makes

it seem likely that it will also turn up in the Gaspé and probably in the Keweenaw Peninsula of northern Michigan, where a number of other so-called Cordilleran disjuncts have been found.

The American range extensions include the following specimens: Newfoundland: Leading Tickles, A. C. Waghorne, 6/18/94, Exploits, Waghorne, 1/2/94, 1/3/94. Ontario: On rock cliff, Gorge Creek, Thunder Bay District, R. F. Cain 2647, September 18, 1944 (distributed as *Amphidium mougeotii*). Colorado: Brandegee, *sine loco*, as "*G. subincurva* n. sp. (Rau)." (*G. subincurva* Aust. is usually listed as a synonym of *G. apocarpa* var. *conferta*; whether the specimen at the New York Botanical Garden had been correctly named *G. incurva*, I could not say.)

**Mielichhoferia recurvifolia** Kindb.—This species, not mentioned in Grout's *Moss Flora of North America*, is represented by two specimens in the National Museum of Canada, labelled "on earth at Lake Agnes, Sept. 14, 1904" and "at the foot of Lake Agnes, alt. 7500 ft., Sept. 14, 1904," both collected by John Macoun. Both are a well-marked form of *Ceratodon purpureus* and can be referred to the var. *dimorphus* (Philib.) C. Jens., which has not previously been recorded from North America. The variety is distinguished by its very small, ovate, acute leaves with margins plane (or sometimes recurved). Authentic material from Norway, as well as three Swiss specimens named by Philibert himself, was kindly sent by Dr. Herman Persson, who also examined the specimen of *Mielichhoferia recurvifolia* in Kindberg's herbarium at Stockholm and confirmed my identification of it.

**Aulacomnium acuminatum** (Lindb. & Arn.) Par. is one of the small but extremely interesting group of mosses which are truly arctic in distribution. Although it was not included in Grout's *Moss Flora of North America*, it is very distinctive and easily recognized even in the field and appears to be fairly common in the Far North, where it has been confused with *Aulacomnium turgidum* (Wahlenb.) Schwaegr. (which it resembles in size and aspect), more often with *A. palustre* var. *imbricatum* BSG and sometimes with robust forms of *A. palustre* (Web. & Mohr) Schwaegr. s. str. It is perfectly distinct from any of those, however, in its large size and stout, terete stems and its leaves, which are broadly lance-acuminate, appressed, and not at all contorted when dry and strongly revolute at the margins.

Steere (1953) presented a map of its total known distribution which includes the valleys of the Lena and Jenisei rivers of Siberia, St. Lawrence Island in the Bering Sea (Persson, 1946), northern and central Alaska, the Yukon, Great Bear Lake and Coppermine in northwestern Canada and Ellesmere, Baffin, Cornwallis, and Prince Patrick Islands in the Canadian Eastern Arctic.

By checking through all the material of *A. palustre*, *turgidum*, and *acuminatum* in the National Herbarium, quite a number of additional localities in Canada were found, extending the range to include Ward Hunt Island (near Ellesmere Island), Southampton Island, and Great Slave Lake. Because the species has been so poorly understood in the past and because considerable material has been distributed under the wrong names, citations to all Canadian specimens represented in the National Herbarium are presented, as follows:



N.W.T. (Franklin District): Admiralty Inlet, Baffin Island, *J. D. Soper* 878 (as *A. turgidum*), 879 (as *A. palustre* var. *imbricatum*). Koukdjuak River, Baffin Island, *Soper* 844 (as *A. palustre*). Lowlands and open tundra, Blue Goose Prairie, Camp Kungovik, 65° 35' N., west coast of Baffin Island, *Soper* 17 (as *A. palustre*). Ward Hunt Island, 83° 05' N., 75° 30' W., *G. Hattersley-Smith* 4. N.W.T. (Keewatin District): Wet low tundra near sea and in damp hollow of high tundra, near Coral Harbour, Southampton Island, *J. C. Ritchie*, July 26, 1954. N.W.T. (Mackenzie District): Great Slave Lake, *J. W. Tenell*, May 25, 1900 (as *A. palustre*). Yukon: In a bog, Bonanza Creek, *J. Macoun*, July 18, 1902, with *A. turgidum* (*Can. Mosses* 165a, as *A. palustre* var. *imbricatum*). In peat bogs along Hunker Creek, *Macoun*, July 23, 1902, and July 25, 1902 (as *A. palustre* var. *imbricatum*). On the hillside back of Dawson, *J. Macoun*, July 12, 1902 (as *A. palustre* var. *imbricatum*). On the slopes in rear of Dawson, *Macoun*, July 12, 1902, with *A. turgidum* (as *A. palustre* var. *subimbricatum* Kindb. n. var., also reported by Persson, 1946).

In addition, another collection from the Far North collected at Herschel Island in the Yukon Territory (*Johansen* 41b, as *A. palustre* var. *imbricatum*) is a mixture of *A. turgidum* and probably *A. acuminatum*, as well, but the material is too poor to permit a more certain determination. We also have a specimen from Thule, Greenland, collected by P. Tseuchen (sp.?) and determined by Hesselbo as *A. palustre*, perhaps correctly so; the material is poor and obviously stunted in growth, but the plants bear considerable resemblance to *A. acuminatum*.

***Thuidium quadrifarium* Mitt.** (Trans. Linn. Soc. London, Bot. 2, 3: 189. 1891) was described from two or more Canadian collections but without precise citation of localities or specimens. Mitten made general reference, however, to a collection by Macoun, as well as to Drummond's *Musci Americani* 214 and Wilson's *Musci Britannici* 395 (which was actually Canadian in origin and had been taken from Drummond's 214 in order to present fruiting material). The species was not mentioned in Macoun's *Catalogue of Canadian Plants* or in Grout's *Moss Flora of North America*, and, in fact, the only references to it in the literature are to be found in Paris' *Index Bryologicus* where it is credited to central Europe as well as to Canada, and in a paper relating to the section *Tetracladium* by Savicz (1917), who said, in passing: "Quant à *Thuidium quadrifarium* Mitt. que M. Mitten a rapporté aussi au sousgenre *Tetracladium*, l'auteur considere cette espèce seulement comme une variété de *Thuidium recognitum* (L.) Lindb. formant un lien entre les sousgenres *Euthuidium* et *Tetracladium*."

Mitten described the species simply as "foliis caulinis illis *T. recogniti* similibus, nervo infra apicem evanescente, rameis latioribus, perichaetialibus integerrimis," but in his discussion he further characterized it "by its continuous stems, not stoloniform at their apices, and the branches in four rows", and distinguished it from *T. recognitum* (Hedw.) Lindb., "which has its branches in two rows only and is arcuate." From this information it was impossible to guess what Mitten had in mind, without recourse to his actual specimens, not only because of the paucity of tangible diagnostic characters but also because of considerable doubt as to Mitten's concept of *T. recognitum*. During Mitten's time *T. delicatulum* (Hedw.) Mitt. and *T. recognitum* were hopelessly confused in Europe and elsewhere, having



been united by Schwaegrichen early in the nineteenth century because Hedwig's type of *T. recognitum* had been mislaid in the same folder with that of *T. delicatulum* (Cardot, 1899), and *T. philibertii* Limpr. was long confused with *T. recognitum* (Dixon, 1913).

Careful study of specimens in Mitten's herbarium at the New York Botanical Garden clearly demonstrated that Mitten did not know *T. recognitum*, as it is now understood, but included in it *T. philibertii*, at least some material of *T. recognitum* and probably some specimens of *T. delicatulum* as well (still an exceedingly common error). Accordingly, his comparison of *T. quadrifarium* with *T. recognitum* has little meaning. Furthermore, all the specimens in his herbarium definitely named *T. quadrifarium* by him proved to be *T. recognitum*. They are a collection made by Macoun in the "Lake Region and Ontario" and two specimens of Drummond's *Musci Americani* 214, with no location (one is *Helodium blandowii* in part, as Mitten also stated) and Wilson's *Musci Britannici* 395, also without place of origin but said by Mitten to have derived from Drummond's 214. Other specimens apparently from Mitten's herbarium, placed in the same folder probably by Mrs. N. L. Britton, are mostly *Thuidium philibertii* Limpr., but there is no direct evidence that Mitten himself had assigned them to *T. quadrifarium*.

Mitten's characterization of the species can be broken down by his faulty concept of *T. recognitum* and various errors in observation: the perichaetial leaves of *T. recognitum* and "*T. quadrifarium*" are only irregularly toothed but entire by comparison with the marginal cilia found in *T. delicatulum* and, to a lesser extent, in *T. philibertii*; the costa of the stem leaves of *T. recognitum* is not actually excurrent, as generally thought, but disappears among radiating, elongate cells which fill the subula, and it is also not excurrent in either *T. delicatulum* or *T. philibertii*; the branches of *T. recognitum* are often irregular or more or less four-ranked, and I believe this to be the case when the plants are crowded in tufts so that the stems grow more or less upright. When they grow loosely, the stems spread horizontally and the branches tend also to lie horizontally in a single plane.

Few species so common and so distinct as *Thuidium recognitum* and *T. delicatulum* have been so misunderstood; *T. philibertii*, which is uncomfortably close to *T. delicatulum* in structure but differs in distribution, has been confused with both. The important distinctions separating these species have been given many times in the literature (Dixon, 1913; Brotherus, 1923; Jansen & Wachter, 1938, 1941; Persson, 1944, 1949; Welch, 1951), but, in North America at least, confusion still reigns supreme. For that reason, a summary of the more striking differences is presented here:

*Thuidium recognitum* has stem leaves which are shortly, broadly, and abruptly acuminate; they are plicate, and the margins are plane or nearly so (when the leaves are removed from the stem); the costa appears to be excurrent, but actually it spreads out and disappears among the elongated cells of the acumen. Furthermore, the tips of the stem leaves are widely spreading from a concave, incurved base. The perichaetial leaves lack cilia. The paraphyllia have papillae at or near the ends of the cells, and they are usually spinose. The operculum is not rostrate or only shortly and bluntly so, about 1 mm. or less in length. American distribution: Nova Scotia to

Alaska and south to Washington and North Dakota, widespread in the East as far south as North Carolina and Georgia and westward to Missouri, Kansas, and Iowa (Figure 1).

*T. delicatulum* has stem leaves averaging 0.9 mm. in length, appressed when dry, erect-spreading when moist, not plicate, rather gradually acuminate, with the costa disappearing in the acumen well below the apex and with the margins recurved from the base to the acumen. The paraphyllia bear smaller papillae along the sides rather than at the ends of the cells. The perichaetial leaves are abundantly ciliate. The operculum is long-rostrate from a conic base and is usually 1 to 2 mm. long. American distribution: Nova Scotia to Minnesota and southward to south-central Florida, westward to Texas and Kansas; also southeastern Arizona and Mexico (Figure 1).

*T. philibertii* is very closely related to *T. delicatulum* and cannot always be satisfactorily segregated from it where the ranges overlap. *T. philibertii* has longer stem leaves (averaging about 1.2 mm.), more finely acuminate, ending in a slender point consisting of 2 to 8 hyaline cells in a single row. The perichaetial leaves are generally thought to be eciliate, but usually a few rather short cilia can be demonstrated and occasionally are rather abundant and well developed. American distribution: Ontario to Alaska, and Iowa and South Dakota to Maine. Because of the perplexing intergradation it would perhaps be best to consider *T. philibertii* a mere form of *T. delicatulum*, except for the fact that it has a distinctive range of distribution and occurs across the continent in the north in a vast area not occupied by *T. delicatulum* (Figure 1). This distinctive range would seem to indicate some degree of genetic differentiation. (In the accompanying maps, only distributions in eastern North America have been plotted, because collections are too few and scattered in the West to give an adequate picture of the actual ranges.)

*Campylium halleri* (Hedw.) Lindb. Among the many specimens collected in Quebec by John Macoun is a particularly interesting one which had been misnamed *Hypnum hispidulum* Brid. Collected "on the roots of trees, Gaspé, Aug. 8, 1882," it is the only specimen known from Quebec and provides another example of a Cordilleran disjunct in eastern North America. Grout (1931) gave the American range of the species as "British Columbia, Newfoundland and Montana. Rare; occasional in the Rocky Mountains." I have examined the specimen from Newfoundland reported by Macoun (1902), who also reported a collection from Labrador, both as *Hypnum macounii* Kindb., and have seen the species growing in the Rocky Mountains, both in Alberta and in British Columbia, where it is not at all uncommon.

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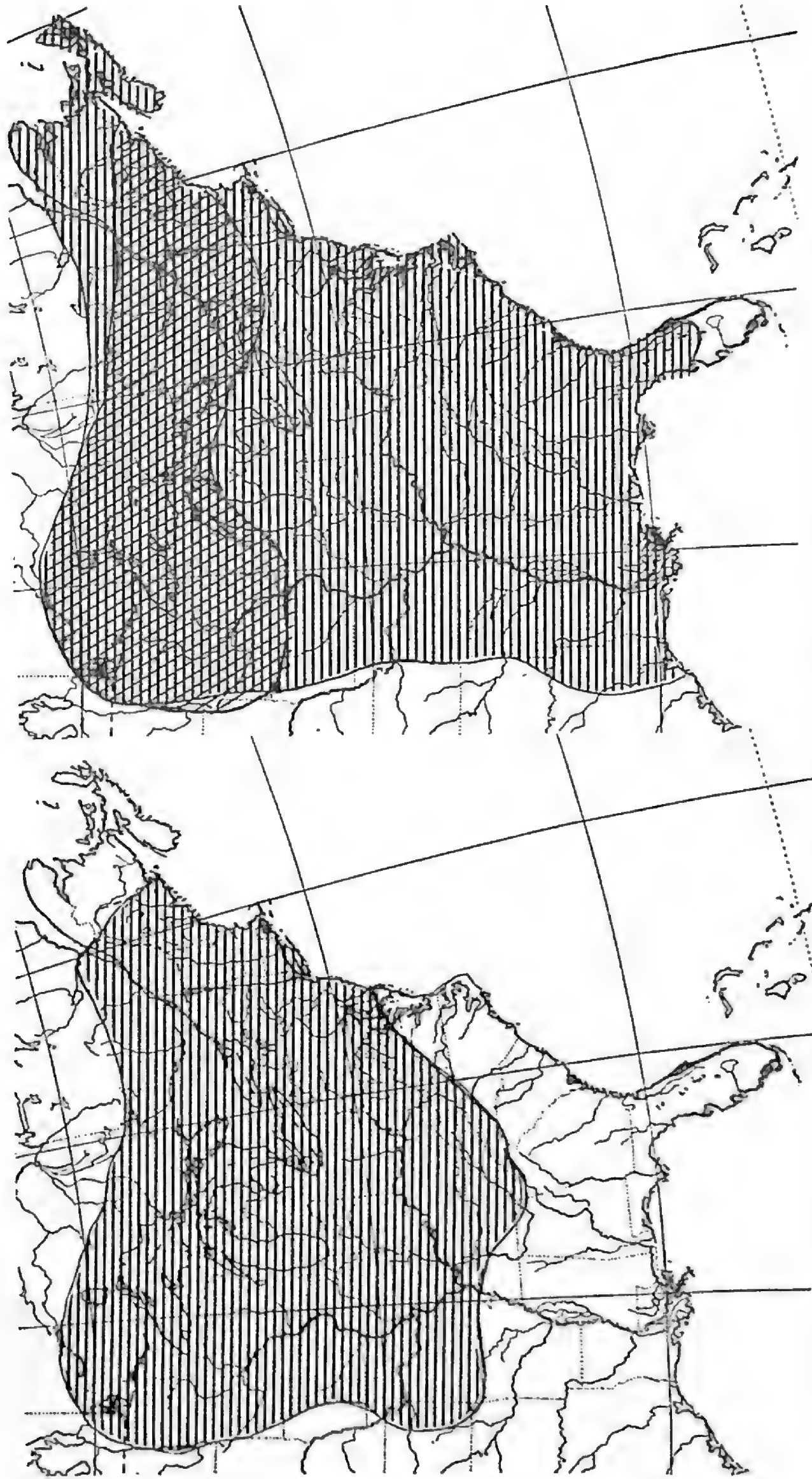


Figure 1. Distribution of three commonly confused species of *Thuidium* in eastern North America. Left: *T. recognitum*. Right: *T. philibertii* restricted to the north, *T. delicatulum* ranging throughout.



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- GESSAIN, ROBERT. Figurine Androgyne Eskimo (*Journal de la Société des Américanistes*, XLIII, 1954, 207-17). The Angmassalik Eskimo attach a gun-holder to the kayak to keep the weapon in place while the kayak is in use. With descriptions and illustrations, the author depicts the variety of anthropomorphic figurines which are used for this purpose.



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- Russian Loan-Words in Alaska (International Congress of Americanists, 30th, 1952, *Proceedings*, London, Royal Anthropological Institute [1955], 114-26). After an interesting summary of Russian influence on the natives of Alaska, the author gives a list of words of Russian origin found in Aleut and Alaskan Eskimo.
- HARRINGTON, J. C. Archeology as an Auxiliary Science to American History (*American Anthropologist*, LVII (6), part 1, Dec., 1955, 1121-30). In this thoughtful appraisal of archæological work on historical sites in Canada and the United States, the author concludes that its value is largely in the accumulation of historical data, rather than in the field of history itself.

- HARRINGTON, RICHARD. Eskimos I have Known (*The Geographical Magazine*, XXVIII (8), Dec., 1955, 387-9). With the aid of superb photographs, the author describes and illustrates incidents of his travels among the Eskimo.
- HAURY, EMIL W. Archeological Theories and Interpretations (*Year Book of Anthropology*—1955, New York, Wenner-Gren Foundation for Anthropological Research, 1955, 115-32). This is a thoughtful appraisal of important archæological work in the last two years, and particularly of the relationship between archæology and other branches of the anthropological sciences.
- HAVIGHURST, ROBERT J., and BERNICE L. NEUGARTEN. *American Indian and White Children: A Sociopsychological Investigation*. Chicago: University of Chicago Press. 1955. Pp. XIII, 335. The material for this report was collected as part of the Indian Education Research Project sponsored by the University of Chicago and the U.S. Office of Indian Affairs. The data comprise the responses of Indian children to five types of test, with comparable figures from white children. The principles involved are as pertinent to Canada as to the United States, and it is probable that the results are equally relevant.
- HEGARTY, DENIS A. A Saint's Grave (*Martyrs' Shrine Message*, XIX (2), June, 1955, 37-8). Archæological work at Ste-Marie has resulted in the finding of Brébeuf's grave.
- HENRY, THOMAS R. Ice Age Man, the First American (*National Geographic Magazine*, CVIII (6), Dec., 1955, 781-806). This is a graphic reconstruction of the life of the first immigrants to America at the time of the last Ice Age, based upon the results of scientific archæological work. Written for non-professional readers and strikingly illustrated with paintings in colour, this article is a good example of the way in which the findings of science can be disseminated broadly, without undue loss of accuracy.
- HERMAN, MARY W. A Reconstruction of Aboriginal Delaware Culture From Contemporary Sources (*Kroeber Anthropological Society Papers*, No. 1, Berkeley, 1950, 45-77). In view of the fact that many of the survivors of the Delaware moved to Canada with the Iroquois loyalists at the end of the eighteenth century, it is proper to include in a Canadian bibliography this reconstruction of Delaware culture based upon seventeenth century writings. It is an example of what can be done by careful use of early records. [This article was inadvertently omitted from earlier bibliographies.]
- HEWES, GORDON W. World Distribution of Certain Postural Habits (*American Anthropologist*, LVII (2), part 1, April, 1955, 231-44). A comprehensive study of sitting and standing postures throughout the world which contains data on these traits among the Indians of Canada.
- HO, PING-TI. The Introduction of American Food Plants into China (*American Anthropologist*, LVII (2) part 1, April, 1955, 191-201). Exhaustive studies of Chinese historical sources indicate that peanuts, sweet potatoes, and maize were introduced into China by the Portuguese in the early sixteenth centuries. Although they spread rapidly, there is no evidence of pre-Columbian diffusion.
- HOFFMAN, BERNARD G. Souriquois, Etechemin, and Kwëdëch—A Lost Chapter in American Ethnography (*Ethnohistory*, II (1), Winter, 1955, 65-87). The names Souriquois, Etechemin, and Kwëdëch were applied by early explorers to Indian tribes of Quebec and the Maritime provinces, but their identification with modern groups has been uncertain. By a study of historical sources and comparison of vocabularies, the author identifies the Souriquois as Micmac, the Etechemin as Algonkians, and the Kwëdëch as the Iroquois of the St. Lawrence valley.
- HOLTVED, ERIK. *Archæological Investigations in the Thule District. III. Nugdlit and Comer's Midden*. (Meddelelser om Grønland, CXLVI (3)). Copenhagen. 1954. P. 132. This is a thorough description of two sites in northwestern Greenland. At Nugdlit a few Dorset culture implements were found, as well as several Norse specimens; Comer's Midden appears to have been occupied continuously from the earliest times until the present. The artifacts recovered are well described. This is a scholarly volume on a site of major importance in the Eskimo archæology of the eastern Arctic.
- HOOPER, J. T., and BURLAND, C. A. *The Art of Primitive Peoples*. New York: Philosophical Library. 1954. P. 168. Planned for the general reader interested in art, rather than for the professional anthropologist, this is a well-balanced and useful volume. The emphasis appears to be on work in wood, with excellent illustrations from the Northwest Coast.



- HOUSTON, JAMES A. The Creation of Anoutaloak (*The Beaver*, 286, winter, 1955-6, 50-3). A well-illustrated description of the materials and symbolism used in the manufacture of a mace by Cape Dorset Eskimo craftsmen for the Northwest Territories Council.
- HULSE, FREDERICK S. Blood-types and Mating Patterns among Northwest Coast Indians (*Southwestern Journal of Anthropology*, XI (2), summer, 1955, 93-104). Blood samples from about 1,200 Indians from Washington and the coast of British Columbia were collected by the University of Washington and the blood-types identified. The data are presented on a tribal basis, with relevant information on tribal marriages.
- HULTKRANTZ, ÅKE. *Conceptions of the Soul among North American Indians: A Study in Religious Ethnology*. (Ethnographical Museum of Sweden, Monograph Series, Publication No. I. Stockholm, 1953. 545 pages. As the title indicates, this is a comparative study of religious beliefs concerning the soul among the American Indians. Following the traditions of German scholarship, the approach is a comprehensive one, both in respect to the scope of the subject matter and in the thorough coverage of the data.
- HYMES, VIRGINIA DOSCH. Athapaskan Numeral Systems (*International Journal of American Linguistics*, XXI (1), Jan., 1955, 26-45). In this comprehensive analysis of the numerical systems used by the Athapaskan-speaking tribes, the author gives both a summary of the principles in the different areas and a detailed study of the data for each tribe.
- INDIAN HEALTH SERVICES; Family Allowances, Indians, Eskimos (in Canada, Department of National Health and Welfare, *Annual Report for the Fiscal Year ended March 31, 1955*, Ottawa, 1955, 78-83; 108). Responsibility for the provision of medical care to approximately 160,000 Indians and Eskimos in Canada is the task of the Indian Health Services. Inherent difficulties are increased by the diverse areas occupied by the natives, but this report shows what is being done and presents a satisfactory picture of progress. The administration of family allowance benefits to Indians and Eskimos is likewise described briefly.
- The Indian News* (I (1-4), Aug., 1954-July, 1955, quarterly). Ottawa: Indian Affairs Branch, Department of Citizenship and Immigration. Indicative of government policy aimed at increased cooperation between the administration and the Canadian Indians, this attractive illustrated news-sheet has been published for free distribution to Indians across Canada. The articles include news items about Indians, as well as notes on changes in government personnel.
- IRVING, WILLIAM. Burins from Central Alaska (*American Antiquity*, XX (4), April, 1955, 380-3). Evidence is accumulating to show the wide distribution of burins in the Arctic, and of their relationship to Old World forms. It appears, however, that at least two complexes are involved, since the material from a site at the University of Alaska shows greater similarity to Asiatic forms than does that recovered at Cape Denbigh on Bering Strait.
- JEFFREYS, M. D. W. Columbus and the Introduction of Maize into Spain (*Anthropos*, L (1-3), 1955, 427-32). In this well-documented and scholarly study, the author argues that maize was being grown in Spain before the time of Columbus and that, accordingly, he did no more than introduce new varieties from the West Indies. This theory explains the occurrence of maize-like plants in Assam as recessive forms of the New World maize, distributed from Africa or Europe to eastern Asia through the medium of the Arabs long before the fifteenth century.
- JENNESS, DIAMOND. Canadian Indian Religion (*Anthropologica*, I, 1955, 1-17). Although Indian beliefs and practices varied in different parts of Canada, a common theme throughout was the close relationship of man to nature.
- JONES H. M. Indian Affairs Branch (in Canada, Department of Citizenship and Immigration, *Report, 1954-55*. Ottawa, 1955, 45-78). Fostered and stimulated by the government, a successful development of the last year has been the increasing participation by the Indians in administrative responsibilities. This report gives factual material, in a somewhat simplified form, on all aspects of government activities, including education, reserves, and finances. This is followed by a well-balanced summary of conditions in the various provinces. The overall picture is a satisfactory one, with obvious recognition of the magnitude of the task. An increase in population is one proof of improving social and physical conditions among the Indians.

- JURY, ELSIE McLEOD. History—From the Horse's Mouth (*Food for Thought*, XV (7), April, 1955, 9-13). Visitors to archaeological excavations in Huronia usually show considerable interest in the techniques being used and gain some insight into the value of archaeology as a means of adding to knowledge of local history.
- JURY, WILFRED, and ELSIE McLEOD JURY. *Saint Louis: Huron Indian Village and Jesuit Mission Site* (Museum Bulletin No. 10). London: Museum of Indian Archaeology, the University of Western Ontario. 1955. 76 pages. Archaeological investigations of a contact-site in Tay Township, Simcoe County, Ontario, has made possible its identification as that of the Jesuit mission of St. Louis. Perhaps more important than this historical aspect, Jury's work has resulted in another thorough investigation of a late Huron village site, overlapping into the period of French penetration. The archaeological material is described in detail and satisfactorily illustrated. This is another significant contribution to Huron archaeology.
- KIDD, KENNETH E. Fashions in Tobacco Pipes among the Iroquois Indians of Ontario (*Royal Ontario Museum of Archaeology Bulletin* 22, Sept., 1954, 15-21). In this interesting description of Iroquois pipes, the author summarizes information on the use of tobacco, and then comments on the variety of pipes and the artistry shown in their manufacture.
- Paul Kane, Painter of Indians (*Royal Ontario Museum of Archaeology Bulletin* 23, May, 1955, 9-13). A scholarly and interesting biographical note on Paul Kane, the distinguished painter of Indians and Indian scenes in the mid-nineteenth century.
- KINGSBURY, ISAAC W. M'Teoulin and Two Versions of a Passamaquoddy Legend (*Bulletin of the Massachusetts Archaeological Society*, XVII (1), Oct., 1955, 1-3). The basis of this article is a series of observations on magic and folk-lore among the Algonkians of northern Maine and southern New Brunswick.
- KRICKEBERG, WALTER. *Ältere Ethnographica aus Nordamerika im Berliner Museum für Völkerkunde*. (Baessler-Archiv, 2.) Berlin, Germany: Dietrich Reimes. 1954. P. 280. This well-illustrated and well-documented description of American ethnological material in Germany is a publication of considerable importance. The specimens, which are principally from eastern Canada and from the United States, include those brought back by explorers and early travellers, as well as a large collection from a Maine showman who sold his material in Germany in 1820. Tribal identification is given wherever possible, and full use is made of comparative sources in attempting to locate the origin of those for which documentation does not exist. The descriptions, which are adequate and detailed, will be of considerable assistance in working out the distribution of manufacturing techniques in eastern North America as well as in the identification of museum specimens.
- KROEBER, A. L. Linguistic Time Depth Results So Far and their Meaning (*International Journal of American Linguistics*, XXI (2), April, 1955, 91-104). A cogent analysis of the strength and weakness of glottochronology as a means of estimating the time at which related languages began to differentiate. The author illustrates his arguments with specific examples.
- Nature of the Land-Holding Group (*Ethnohistory*, II (4), fall, 1955, 303-14). Although Indian groups existed in all parts of North America to whom the term *tribe* could be applied on the basis of linguistic and cultural similarity, the land-owning unit was usually a smaller group, comprising a village or band.
- KURATH, GERTRUDE P. The Tutelo Fourth Night Spirit Release Singing (*Midwest Folklore*, IV (2), 1955, 87-105). Although Tutelo ceased to exist as a spoken language on the Grand River Reserve about 40 years ago, it was still possible in 1952 to record the text and music of a mourning ritual used four nights after a death. Musical analysis and comparison point to resemblances with the Middle West. Apart from its value in suggesting tribal contacts, this article illustrates the continuity of music even when the meaning of the words used in the songs has been lost.
- LANE, KENNETH S. The Montagnais Indians, 1600-1640 (*Kroeber Anthropological Society Papers*, No. 7, Berkeley, 1952, 1-62). The author cites seventeenth century writings to summarize Montagnais-Naskapi life as seen through the French missionaries and explorers of the period. [This paper was inadvertently omitted from earlier annual bibliographies.]



- LANTIS, MARGARET. Problems of Human Ecology in the North American Arctic (*Arctic*, VII (3 and 4), 1954, 307-20). Recent investigations having proved that Eskimo culture is more diverse than was formerly believed, it is logical to aim at making detailed studies of precise aspects of cultural inter-action both between the Eskimo and their natural environment, and between them and other human groups.
- LAVIOLETTE, GONTRAN. Notes on the Aborigines of the Province of Quebec (*Anthropologica*, I, 1955, 198-211). This is a useful general description of the modern Indians of Quebec, giving information about the location of the reserves and the numbers and tribal affiliations of the inhabitants.
- LEACOCK, ELEANOR. Matrilocality in a Simple Hunting Economy (Montagnais-Naskapi) (*Southwestern Journal of Anthropology*, XI (1), spring, 1955, 31-47). In earlier descriptions of the social structure of the Montagnais-Naskapi of northern Quebec, it appeared that the social groups were, in effect, bilateral, with a frequent tendency to post-marriage matrilineal residence. With the increasing importance of the trading-post, residence is tending to become patrilineal and patrilineal institutions to become more definite.
- LEE, THOMAS E. The Second Sheguiandah Expedition, Manitoulin Island, Ontario (*American Antiquity*, XXI (1), July, 1955, 63-71). Further archaeological work at Sheguiandah, Manitoulin Island, Ontario, has confirmed the findings of previous years and produced evidence of a still earlier cultural horizon. Five strata can be recognized. The latest appears to be Point Peninsula, and below that is a layer resembling George Lake I. From below that have come specimens resembling those at Brewerton, New York, but the two lowest layers appear to have no similarities to findings elsewhere. The critical problems are of typology and geological age. The latter hinges on the fact that they were deposited on a beach which is 71 feet above the 1952 level of Lake Huron.
- LEECHMAN, DOUGLAS, MARGARET HESS, and ROY L. FOWLER. Pictographs in Southwestern Alberta (National Museum of Canada, Bulletin 136, *Annual Report for the Fiscal Year 1953-54*, Ottawa, 1955, 36-53). A description and illustrations are given of hitherto undescribed pictographs in southern Alberta. Most of them are on glacial erratics, frequently near the paths used by bison in their wanderings. The meanings are unknown.
- LEIGHTON, ALEXANDER H., and CHARLES C. HUGHES. Notes on Eskimo Patterns of Suicide (*Southwestern Journal of Anthropology*, XI (4), winter, 1955, 327-38). Information is given on several cases of suicide among the Eskimo of St. Lawrence Island, Alaska, as an introduction to a general survey of this practice among the Eskimo.
- LEITCH, ADELAIDE. Porcupine Crafts (*Canadian Geographical Journal*, LI (3), Sept., 1955, 128-9). A brief note on porcupine quill-work used in the decoration of baskets by the Ojibwa of Parry Island, Ontario.
- LEMERT, EDWIN M. *Alcohol and the Northwest Coast Indians* (University of California Publications in Culture and Society, II (6)). Berkeley: University of California Press. 1954. P. 105. This study, largely devoted to the Indians of British Columbia, is based on library material, supplemented by field research. It is a valuable document in terms of the data brought together, but the analysis is insufficient to make it a definitive work.
- The Life and Death of an Indian State (*Human Organization*, XIII (3), fall, 1954, 23-7). Under the influence of Roman Catholic missionaries in the 1860's, native religion rapidly gave way to Christianity among several of the southern Coast Salish groups. For about thirty years the missionary priests dominated secular as well as spiritual life, resulting in what was virtually a church state. This lost its strength as isolation broke down with the spread of European contacts.
- LESAGE, JEAN. Enter the European. V—Among the Eskimos (part II) (*The Beaver*, Outfit 285, spring, 1955, 3-9). The Minister of Northern Affairs and National Resources, the Department responsible for administration in the Arctic, summarizes the official position in regard to government responsibility for the Eskimo. Steps are being taken to implement a policy of native participation in the rapidly changing conditions in the north.

- LITTON, GASTON. The Resources of the National Archives for the Study of the American Indian (*Ethnohistory*, II (3), summer, 1955, 191-208). This is a useful description of the large amount of archive material in the United States that is available for study of the American Indians, with some indication of its limitations.
- LOWIE, ROBERT H. *Indians of the Plains*. (American Museum of Natural History, Anthropological Handbook, No. 1). New York: McGraw-Hill Book Co. 1954. P. XIII, 222. This summary of the life of the Plains Indians is a model for all such compilations. The author draws on his own experience and knowledge to present a well-balanced and informative picture of the principal aspects of life on the prairies.
- Reflections on the Plains Indians (*Anthropological Quarterly*, XXVIII (2), April, 1955, 63-86). With knowledge based on many years of scholarly study of the Plains Indians, Lowie discusses a number of questions of possible origins of Plains Culture traits and defends the position taken by the late Clark Wissler.
- LUSSAGNET, SUZANNE. Bibliographie Américaniste (*Journal de la Société des Américanistes*, XLIII, 1954, 249-349). Following the pattern established for many years, the author gives an extremely comprehensive bibliography of publications in all branches of anthropology pertaining to America. Each of the main subjects is arranged on a geographical basis.
- MACGREGOR, GORDON. Anthropology in Government: United States (in *Year Book of Anthropology—1955*, New York, Wenner-Gren Foundation for Anthropological Research, 1955, 421-33). Though dealing specifically with the rôle of anthropology in United States administration, this article includes a great deal of material that is relevant to Canada.
- MACKAY, CORDAY. Pacific Coast Fur Trade (*The Beaver*, 286, summer, 1955, 38-42). A semi-popular article on fur-trading on the coast of British Columbia in the 1830's, with a few observations on the Indians.
- McKELVIE, B. A. Cold War on the Fraser (*The Beaver*, 286, autumn, 1955, 12-15). A popular description of the hostility that existed between Indians and white traders on the lower Fraser following the establishment of Fort Langley in 1827.
- MACNEISH, JUNE HELM. Folk-tales of the Slave Indians (*Anthropologica*, I, 1955, 37-44). A series of short Slave (Athapaskan) folk-tales recorded in English at Fort Simpson, Northwest Territories.
- MACNEISH, RICHARD S. Two Archaeological Sites on Great Bear Lake, Northwest Territories, Canada (National Museum of Canada, Bulletin 136, *Annual Report for the Fiscal Year 1953-54*, Ottawa, 1955, 54-84). Archaeological work on the shore of Great Bear Lake revealed sites having three cultural superpositions. The oldest, contemporary with the mammoth, has affiliations with the Plainview complex on the Plains, dated by Carbon 14 at 10,500 to 8,000 years ago. The middle horizon contained Angostura Points and is likewise related to a Plains culture. The upper layer contains burins and microliths pertaining to the Dorset culture in Arctic Canada, to Denbigh in Alaska, and to sites in Asia. This is an excellent description of an important piece of work.
- MAHR, AUGUST C. Eighteenth Century Terminology of Delaware Indian Cultivation and Use of Maize: A Semantic Analysis (*Ethnohistory*, II (3), summer, 1955, 209-40). Linguistic analysis of Delaware words for corn and its uses throws light on various aspects of the cultivation and preparation of this crop.
- Semantic Analysis of Eighteenth-Century Delaware Indian Names for Medicinal Plants (*Ethnohistory*, II (1), winter, 1955, 11-28). An analysis of Delaware terms for medicinal plants throws considerable light on the methods of their use, as well as on the properties ascribed to them.
- MALLERY, ARLINGTON H., GARDNER C. EASTON, and JOHN HOWIESON. *Special Interim Report of an Examination of the Newport Tower and its Previous History, made to the Council of the City of Newport, R. I., October, 1955*. Newport, R. I. 1955. Pp. 19. The writers of this report, comprising nineteen sheets of foolscap, believe that the Newport Tower is pre-Columbian and the oldest European building in America. They believe that it was altered in the seventeenth century, not that it was built at that time. This report challenges the findings of an expert committee of the Society for American Archaeology.

- MANDELBAUM, DAVID G. The Indian Tribes of North America (*Kroeber Anthropological Society Papers*, No. 2, Berkeley, 1950, 51-78). Written for an encyclopædia, this is a broad but accurate summary of the history of the American Indians, with a survey of the cultures of each geographical region, and a listing of the tribes of each. It is the kind of synthesis that is useful for the general reader or the elementary student. [This article was inadvertently omitted in previous bibliographies.]
- MARSH, D. B. Arctic Mug-up (*The Beaver*, 286, winter, 1955-6, 42-3). A series of photographs illustrating the brewing of tea by the natives of Eskimo Point.
- MATSON, FREDERICK R. Charcoal Concentration from Early Sites for Radiocarbon Dating (*American Antiquity*, XXI (2), Oct., 1955, 162-9). A technical paper on the collecting of carbon samples in the field for use in dating by radiocarbon analysis.
- MENZEL, DOROTHY. Papers Relating to the Trial of Feodor Bashmakof for Sorcery at Sitka in 1829. Translated from the Russian by Ivan Petrov, with Ethnographic Comments (*Kroeber Anthropological Society Papers*, No. 5, Berkeley, 1952, 6-25). The manuscript published herewith is a copy of Russian documents made for the distinguished historian, H. H. Bancroft, and preserved at the University of California. The accused, who was found guilty, was a native Tlingit who had been ordained as a subordinate priest. The evidence furnishes a striking example of cultural continuity and of the cultural integration of religious beliefs. [This article was inadvertently omitted in earlier bibliographies.]
- MICKEY, BARBARA HARRIS. The Family Among the Western Eskimo (*Anthropological Papers of the University of Alaska*, IV (1), Dec., 1955, 13-22). A careful study of the literature reveals that polygamous, extended, and nuclear families all occurred among the western Eskimo of Alaska.
- MILLER, ERWIN C. Aksunai (*Canadian Geographical Journal*, LI (1), July, 1955, 256-63). An interesting description of a winter trip made by plane and dog-sled with the visiting doctor to scattered families of Naskapi Indians and of Eskimo in Labrador, written in popular style. It gives examples of the problems of medical care in a difficult area.
- MILLER, WALTER B. Two Concepts of Authority (*American Anthropologist*, LVII (2), part 1, April, 1955, 271-89). At the time of European contact, authority among the Central Algonkians was exercised without the existence of "chiefs" in the European sense of the word.
- MOODY, JOSEPH P., with W. DE GROOT VAN EMBDEN. *Arctic Doctor*. New York: Dodd, Mead & Co. 1955. P. 274. This is a fascinating description of the life and work of a government doctor in the eastern Arctic. Anecdotes of his experiences among the Eskimo show a sympathetic understanding of their problems and throw considerable light on changing conditions in the north.
- MÜLLER, WERNER. *Die Blaue Hütte: Zum Sinnbild der Perle bei Nordamerikanischen Indianern*. (Studien zur Kulturkunde, 12). Wiesbaden, Germany: Franz Steiner. 1954. P. 145. This is a comprehensive study of the Midewiwin, the shaking tent, and other religious rituals of the Ojibwa and adjacent tribes of the Upper Lakes. Although no new field material has been added, the bringing together of published data, and its analysis in thorough German fashion make the work of considerable value.
- The Native Voice* (IX (1-12), Jan.-Dec., 1955, monthly). Vancouver: Native Voice Publishing Co., 325 Standard Building. Although much of the material in this Indian newspaper is of transitory interest, cumulatively it is of considerable lasting value as illustrating the activities and interests of the Indians of Canada in 1955.
- NELSON, WILLIS H. A Burial Cave on Kanaga Island, Aleutian Islands (*American Antiquity*, XX (4), April, 1955, 387-92). This is a preliminary description of an Aleut burial cave containing seven crania and the remains of a boat.
- NORBECK, EDWARD. Trans-Pacific Similarities in Folklore: A Research Lead (*Kroeber Anthropological Society Papers*, No. 12, Berkeley, 1955, 62-9). Striking similarities in folklore between Formosa and Luzon on the one hand, and Columbia and Guiana on the other, suggest cultural inter-actions between the two areas. A possible explanation would appear to be in the transportation of Indians from one part of the Spanish realm to another in Colonial times.



- OLESON, T. J. The Vikings in America: A Critical Bibliography (*The Canadian Historical Review*, XXXVI (2), June, 1955, 166-73). As the title indicates, this is an extensive and critical bibliography of Viking voyages to America, and of reputed Viking remains in the New World.
- OLSON, RONALD L. Black Market in Prerogatives Among the Northern Kwakiutl (*Kroeber Anthropological Papers*, No. 1, Berkeley, 1950, 78-80). A decrease in population among the Kwakiutl of Rivers Inlet has led to the concentration of ancestral prerogatives in the hands of a few individuals. This, in turn, has facilitated their illegal transmission by sale, a practice condemned by public opinion, but commonly carried out in the degeneracy of native culture. [This article was inadvertently omitted in earlier bibliographies.]
- Notes on the Bella Bella Kwakiutl (*Anthropological Records*, XIV (5), 1955, 317-48). In view of the early breakdown of native culture among the mainland Kwakiutl, any information about these groups is of importance. In the course of ethnological field-work in 1935 and 1949, Olson collected a certain amount of data on the Bella Bella, and on the Xaxais of Cone Island (China Hat). At a time when few of the Indians were aware of their own past or interested in it the author has succeeded in recording considerable information about village and "tribal" movements, clans, kinship, and marriage, as well as a number of folk-tales. The presentation is clear and logical.
- OSWALT, WENDELL. Alaskan Pottery: A Classification and Historical Reconstruction (*American Antiquity*, XXI (1), July, 1955, 32-43). The author gives a comprehensive analysis of types of pottery occurring in Alaska, with the distribution of each, and a chart of their presumed chronology.
- Prehistoric Sea Mammal Hunters at Kaffia, Alaska (*Anthropological Papers of the University of Alaska* IV (1), Dec., 1955, 23-61). Archaeological work in the Katmai National Monument in coastal southern Alaska indicates that the area was sparsely populated by an Eskimo-speaking population in the fifteenth and sixteenth centuries. They were largely dependent for food on hair-seals and clams.
- PAULSON, IVAR. Swedish Contributions to the Study of Primitive Soul-conceptions (*Ethnos*, XIX (1-4), 1954, 157-67). Many examples of beliefs concerning the soul among primitive peoples have been drawn by Swedish scholars from American Indian data.
- PEAKE, ORA BROOKS. *A History of the United States Indian Factory System, 1795-1822*. Denver: Alan Swallow, 1954. P. 340. Although this volume deals only with United States policy toward Indians at one particular period and in one particular aspect, it is worthy of mention in a Canadian bibliography as an instance of an unfortunate example of government control.
- PEARCE, ROY HARVEY. *The Savages of America: A Study of the Indian and the Idea of Civilization*. Baltimore: Johns Hopkins Press. 1953. Pp. XIII, 252. A historical and philosophical study of European concepts of, and attitudes toward the American Indians between the beginning of the seventeenth and the middle of the nineteenth centuries.
- Pipes and Pipestone*. (Indian Leaflets 11 and 12.) St. Paul: The Science Museum, n. d. Pp. [8]. A popular and well-illustrated sketch of the pipes used by the Indians of North America, especially those of Catlinite, common on the northern plains and Minnesota.
- POHL, FREDERICK J. The Ship's Shoring at Follins Pond (*Bulletin of the Massachusetts Archaeological Society*, XVI (3), April, 1955, 53-60). On the basis of geographical considerations, the author believed that the Vikings had reached the shore of Follins Pond, Cape Cod and camped there. Archaeological investigations at a likely spot revealed a row of posts, supported by stones, which apparently served to shore-up a beached vessel. These supports indicated its size as 69 feet in length, and 18 feet in width. The shoring posts were not heavy enough to support a vessel of the weight of a post-Columbian ship of this size but could have held a Viking galley. The author presents this evidence of Norse penetration to Cape Cod.



- RADWANSKI, PIERRE. Anthropological Structure of 101 Eskimo from Baffin Island and the Province of Quebec (*Anthropologica*, I, 1955, 72-83). Measurements are given of 74 Eskimo from Baffin Island, 24 from northern Quebec, 2 from Goose Bay, and 1 from Southampton Island, all hospital patients in Quebec City. Standard measurements were taken on strictly anatomical features, as well as physiological observations on the nose, lips, hair, and ears.
- RAPHAEL, RALPH B. *The Book of American Indians*. New York: Arco Publishing Co. 1954. P. 144. A popular book about Indians, written by an amateur, and well suited to High School students.
- REICHLEN, HENRY. Les Collections Américaines du Musée d'Angers (*Journal de la Société des Américanistes*, XLIII, 1954, 161-72). Included among the exhibits of a museum at Angers, France, are specimens brought back from Canada in early times. A number of these are described in sufficient detail to aid in clarifying the distribution of culture traits in the New World.
- RENAUD, ANDRÉ. From Oldest to Newest: Our Indian Citizen (*Food for Thought*, XV (7), April, 1955, 4-8). With increasing opportunities through education and social services, the Indian standards of living are rising, and Indians are taking a more active part in administration. But on leaving a reserve, an Indian still faces difficulties in adjustment, largely due to race prejudice on the part of white Canadians.
- RENAUD, E. B. The Pebble Industry (*The Masterkey*, XXIX (5), Sept.-Oct., 1955, 148-53). The author believes that certain early stone cultures of western America are genetically related to the Pre-Chellean and Chellean periods of Palaeolithic Europe.
- Report on the Oneida, Stockbridge and Brotherton Indians—1796—by Jeremy Belknap and Jedidiah Morse*. (Indian Notes and Monographs, No. 54). New York: Museum of the American Indian, Heye Foundation. 1955. P. 39. In 1796 "The Society established in Scotland for promoting Christian Knowledge" sent the Reverend Jeremy Belknap and the Reverend Jedidiah Morse from Boston to Upstate New York to report on conditions among the Indians in whose service the Society was supporting two missionaries. Their report was submitted to the Board of the Society and published in 1798. A manuscript copy of this report was recently acquired by the Heye Museum and is reproduced in this volume. It throws considerable light on the life of the Indians, largely Iroquois, in the late eighteenth century.
- RICHTHOFEN, BOLKO FRHR. v. Bedeutsame neue Altertumsfunde aus Nord-Kanada (*Anthropos*, L (4-6), 1955, 949). An important archaeological discovery by MacNeish in the Yukon indicates a cultural connection with sites in Siberia having an antiquity of 3,000 to 5,000 years.
- RIDDELL, FRANCIS A. Climate and the Aboriginal Occupation of the Pacific Coast of Alaska (*Kroeber Anthropological Society Papers*, No. 11, Berkeley, 1954, 60-124). From a comprehensive study of the literature, supplemented by a certain amount of field work, the author concludes that the earliest permanent inhabitants of the coast of Alaska were culturally (and perhaps biologically) akin to the Eskimo, and that the occupancy took place about 4,000 years ago.
- RIOUX, MARCEL. Notes autobiographiques d'un Iroquois Cayuga (*Anthropologica*, I, Ottawa, 1955, 18-36). This record of incidents in the life of a Cayuga Indian of the Grand River Reserve near Brantford throws light on Iroquois attitudes in a changing world.
- RITCHIE, WILLIAM A. The Northern Burial Cult (*Pennsylvania Archaeologist*, XXV (1), June, 1955, 45-9). Archaeological work in New York State and southern Ontario indicates the existence of a relatively complex cult of the dead, shown by elaborate burials. This set of beliefs may be the basis of the more developed rituals of the Hopewell period.
- ROBERTS, HELEN H., and MORRIS SWADESH. Songs of the Nootka Indians of Western Vancouver Island (*Transactions of the American Philosophical Society*, XLV (3), 1955, 199-327). In 1910 and 1913 the late Edward Sapir, then on the staff of the Geological Survey and of the Victoria Memorial Museum in Ottawa, collected the texts of ninety-six Nootka songs from Vancouver Island and recorded the music on a phonograph. He was unable to complete their publication before his death, though certain linguistic data were printed. This rich store of material is now published in satisfactory form.

by two of Sapir's former students, each highly qualified in a specific field. Miss Roberts records the information from Sapir's original notes, supplemented with other information, and gives an analysis of the structure of each type of song. Then follow the songs themselves, with musical notation and analysis. Swadesh describes the linguistic material, including stylisms, as well as the musical instruments and ethnological data.

- ROE, FRANK GILBERT. *The Indian and the Horse*. Norman, Oklahoma: University of Oklahoma Press. 1955. XVI, 434. Like Roe's earlier book on the bison (*The North American Buffalo*, Toronto, 1951), this volume has many of the characteristics of an overgrown literary essay of the Victorian period. He deals at great length with details of the precise date when individual tribes obtained their first horses, and then describes the role of the horse and the changes that it caused in various aspects of Indian culture. Although the scope is excellent, the author appears to rely unduly on secondary sources and to have had little first-hand experience of Indian life. This affects unfavourably the "balance" of the volume, and biologists will reject his hypothesis of prenatal influence on the birth of pintos. Irrespective of conclusions, however, Roe has brought together a mass of scattered data on a most important theme.
- ROUSSEAU, JACQUES. Le nom du caribou chez les Montagnais-Naskapi et les Esquimaux de l'Ungava (*Anthropologica*, I, 1955, 212-14). A note on the names for caribou in the native languages of Quebec.
- Le partage du gibier dans la cuisine des Montagnais-Naskapi (*Anthropologica*, I, 1955, 215-17). There are definite rules for the division of different parts of game animals among the Indians of Quebec.
- La Religion Primitive des Montagnais et des Hurons (International Congress of Americanists, 30th, 1952, *Proceedings*, London, Royal Anthropological Institute, [1955], 151-4). A brief note on the fundamental dualism found among many of the Indian tribes of the northeast, including the Montagnais and the Hurons.
- ROWLEY, G. W. Settlement and Transportation in the Canadian North (*Arctic*, VII (3 and 4), 1954, 336-42). Reasons for the location of settlements in the Arctic have changed from those based on an aboriginal hunting economy to the requirements of the fur-trade and, in recent years, in accordance with broad economic and strategic demands. Though vitally affected, the needs of the native peoples have received little consideration in these arrangements.
- RUSSELL, CHARLES. Centralizing New York Indian Schools (*The American Indian*, VII (2), spring, 1955, 45-54). Until recently the New York State Department of Education has provided educational facilities for Indian children in the state. In the last year, a process of centralization has been adopted with the aim of amalgamating rural school districts. In consequence, authority for Indian schools is being transferred to local authorities, in which the Indians are in a minority. Although designed only as an experiment for one year, this move has been opposed by the Indians. The results of this policy are relevant to education problems in Canada.
- SAPIR, EDWARD, and MORRIS SWADESH. Native Accounts of Nootka Ethnography (*International Journal of American Linguistics*, XXI (4), part 2, Oct., 1955, 1-157); which is also, (*Indiana University Research Center in Anthropology, Folklore and Linguistics*, Publication I). This important volume comprises thirty-five texts collected by Sapir and native assistants near Alberni, Vancouver Island, between 1914 and 1924. This is, in effect, a second volume of Sapir's *Nootka Texts*, published in 1939; a third volume is in preparation. Apart from the value of the material for purely linguistic purposes, the texts give a well-chosen series of accounts of rituals, speeches, war expeditions, and other activities, as described by the natives themselves. The translation is less detailed than in the earlier work but retains the "feeling" of Nootka, though rendered into flowing English. With this volume the Nootka have become one of the best-known Canadian tribes.
- SMITH, MARIAN W. Continuity in Culture Contact: Examples from Southern British Columbia (*Man*, LV, July, 1955, 100-105). In the knitting of a special type of sweater and in the manufacture of racing canoes, the Coast Salish of southern British Columbia have developed two of their aboriginal cultural elements and adapted them into the pattern of modern life.



- SMITH, NICHOLAS N. Premonition Spirits Among the Wabanaki (*Bulletin of the Massachusetts Archaeological Society*, XV (3), April, 1954, 52-6). Myths and anecdotes collected among the Malecite of New Brunswick describe a supernatural being whose function is to give warning of approaching misfortune.
- Wabanaki Dances (*Bulletin of the Massachusetts Archaeological Society*, XVI (2), Jan., 1955, 29-37). The author was able to collect data on dances among the Penobscot and Passamaquoddy of Maine and the Malecite of New Brunswick, though most of their culture has disappeared. Much interest was aroused by the use of sound recordings taken by the late Frank Speck in 1910.
- SOLECKI, RALPH S. Lamellar Flakes Versus Blades, A Reappraisal (*American Antiquity*, XX (4), April, 1955, 393-4). A plea for greater precision in the use of the terms *flake*, *blade*, and *lamella* in Arctic archaeology.
- STONE, KIRK H. Human Geographic Research in the North American Northern Lands (*Arctic*, VII (3 and 4), 1954, 321-35). In studying the changes in population and patterns of settlement in the Canadian Arctic, full consideration must be given to the adjustment of the Eskimo and the northern Indians to these new conditions.
- SUTTLES, WAYNE. Post-Contact Culture Change among the Lummi Indians (*The British Columbia Historical Quarterly*, XVIII (1 and 2), Jan.-April, 1954, 29-102). This is an important study of the changes that have occurred since European contact among the Lummi, a Coast Salish tribe living on the Washington side of the Strait of Juan de Fuca but closely related to tribes of islands in the straits, and of Vancouver Island. After a clear summary of native culture, the author follows a historical pattern in describing European contact and its effects at various periods to the present. It is an excellent example of very able ethnohistorical work, utilizing the techniques of the anthropologist, the historian, and the sociologist, all combining to show both continuity and change in culture elements.
- SWEETMAN, PAUL W. A Preliminary Report on the Peterborough Petroglyphs (*Ontario History*, XLVII (3), 1955, 101-21). Though entitled *preliminary*, this article presents a well-illustrated description of extensive petroglyphs found north of Peterborough, Ontario. Rock carvings are unusual in this part of the province; they may be culturally related to art forms of the Ojibway. The author appends a brief account of an Iroquoian site in the vicinity.
- THIBERT, ARTHUR. Le Journal Quotidien d'un Esquimau de l'Ile de Southampton, 1926-1927 (*Anthropologica*, I, 1955, 144-97). This diary, written in the winter of 1926-27 by a Southampton Island Eskimo for his own records, describes the daily incidents of his life, with specific details of the results of hunting.
- THOMPSON, LAURA. La Reorganización Indígena de Los Estados Unidos Considerada como un Experimento en la Investigación de Acción Social (*América Indígena*, XV (3), Julio, 1955, 187-98). The United States government has taken a far-reaching step in the administration of its Indian affairs in the Indian Reorganization Act. The author explains its significance and expands on its importance in the field of the social sciences as an example of government action in which there is participation by those subject to the administration.
- Thunderbird Park: Victoria, British Columbia, Canada.* Victoria: The British Columbia Government Travel Bureau, Department of Trade and Industry, n. d. P. 31. This is a popular and well-illustrated description of the totem poles and other heraldic emblems erected in Victoria to preserve this aspect of aboriginal Northwest Coast art. The well-balanced and informative introductory text is by Wilson Duff of the Provincial Museum.
- TRAGER, GEORGE L. The Language of America (*American Anthropologist*, LVII (6), part 1, Dec., 1955, 1182-93). Included in this survey of language studies and objectives in America is a section on the needs of further detailed investigation of American Indian languages.
- TSCHOPIK, HARRY, JR. *Indians of North America* (American Museum of Natural History, Science Guide, No. 136). New York: American Museum of Natural History, 1952. P. 64. Aimed to provide a general picture of the history and culture of the North American Indians for the benefit of the general reader, this handbook fulfils its purpose admirably. The illustrations are well-chosen and well-reproduced, and the text is informative and accurate. This is an extremely satisfactory volume. [This volume was inadvertently omitted from earlier bibliographies.]

- TURNER, GEOFFREY. Hair Embroidery in Siberia and North America. (Pitt-Rivers Museum, University of Oxford, *Occasional Papers on Technology*, No. 7). Oxford: University Press. 1955. P. 83. Although moose-hair embroidery on cloth and birch-bark from the Indians of Quebec and Ontario has been described in some detail, this is the first comprehensive study of its manufacture and distribution. Thoroughly at home in technical details, the author describes the hairs used and illustrates the microscopic differences that make it possible to distinguish between those of moose, caribou, and other mammals. Next, he describes the manufacturing processes, the designs, and the distribution of the trait. It appears to be an early Asiatic-American element in which the designs particularly have been modified by culture contact. The illustrations, largely from specimens in British museums, are excellent.
- VANSTONE, JAMES W. Archaeological Excavations of Kotzebue, Alaska (*Anthropological Papers of the University of Alaska*, III (2), May, 1955, 75-155). Important archaeological work at Kotzebue Sound has revealed a large summer settlement, with culture traits both of the traditional Eskimo type and of an interior hunting culture similar to that of the Athapaskan Indian tribes. Dated in the fifteenth and sixteenth centuries, the culture can be described as of an inland type profoundly influenced by the coastal environment.
- VERRILL, A. HYATT. *The Real Americans*. New York: G. P. Putnam's Sons. 1954. P. 309. A popular description of the American Indians and their culture, written with sympathy and with considerable understanding of their arts and crafts. Unfortunately, the volume is marred by serious factual errors, particularly in regard to the western tribes, and by unsubstantiated statements about the "mystery" of Indian origins.
- VINAY, J.-P. Classification de la Famille Linguistique Algonquin-Ritwan (*Anthropologica*, I, 1955, 103-18). With clear and cogent analysis, the author postulates a genetic relationship between the Algonkian languages, extending from the Atlantic to the Rockies, and five stocks of British Columbia.
- Walam Olum, or Red Score: The Migration Legend of the Lenni Lenape or Delaware Indians*. Indianapolis: Indiana Historical Society. 1954. Pp. XIV, 379. In 1833 the botanist Rafinesque recorded the Walam Olum, purporting to be the tribal migration legend of the Delaware, together with the texts of the songs used with it, and copies of the pictographs which served as mnemonic devices to recall the songs. In 1836 he published a free translation of the myth. This volume, which is really a progress report of the results of twenty years of work by a group of distinguished scholars, comprises a complete transcription of the original manuscript, with detailed linguistic analysis of each line and word. The pictographs, too, are published with a scholarly analysis of similar symbols throughout the eastern woodlands. Apart from these internal analyses, the authors describe the history of Rafinesque and his times, as well as a summary of Delaware culture and archaeology, in which the Walam Olum has its setting. The detailed scholarship is a model of cooperative industry of the highest quality.
- WALLIS, RUTH SAWTELL. The Changed Status of Twins Among the Eastern Dakota (*Anthropological Quarterly*, XXVIII (3), July, 1955, 116-20). In aboriginal times, twins were regarded with what amounted almost to religious respect by the Dakota. Today as observed in two Manitoba cases, survivals of this attitude have placed the individual in a slightly ambiguous position in the community.
- WALLIS, WILSON D., and RUTH SAWTELL WALLIS. Culture Loss and Culture Change Among the Micmac of the Canadian Maritime Provinces, 1912-1950 (*Kroeber Anthropological Society Papers*, Nos. 8 and 9, Berkeley, 1953, 100-29). In 1911 and 1912, W. D. Wallis made a comprehensive study of the Micmac Indians in New Brunswick and Nova Scotia, with the exception of Cape Breton. He returned to the same ground thirty-eight years later to note specifically the changes that had occurred in the intervening period, including the disappearance of a certain number of aboriginal traits. [This article was inadvertently omitted in previous bibliographies.]
- The Micmac Indians of Eastern Canada*. Minneapolis: University of Minnesota Press. 1955. Pp. XVI, 515. There are few Canadian Indian tribes whose culture has been studied from various aspects and integrated into a single volume. This is what the Wallises have done for the Micmac. Much of the material was collected by Wilson D. Wallis as a young field worker in 1911-12 but was never published; both authors visited the tribe in 1951 and 1953, adding a small amount of new ethnological



data and much information on culture changes in the preceding forty years. Historical records have been used extensively, in order to bring together everything of value pertaining to the Micmac.

- WATERER, JOHN W. Antler-Combs (*Antiquity*, XXIX (115), Sept., 1955, 158-9). Combs of antler, similar to specimens found in Neolithic Europe, were used by the western Eskimo to remove loose hair from skin clothing.
- WEATHERWAX, PAUL. *Indian Corn in Old America*. New York: Macmillan Co., 1954. Pp. VII, 253. As the title indicates, this is a study of maize, well illustrated and well documented. The author treats its use by the Indians in a thorough fashion, together with its spread to Europe and its adoption there, as well as into the European culture of modern America. The botanical section is adequate but less exhaustive.
- WILFORD, LLOYD A. A Revised Classification of the Prehistoric Cultures of Minnesota (*American Antiquity*, XXI (2), Oct., 1955, 130-42). This thorough analysis of archaeological horizons in Minnesota is of major significance in treating culture sequences in Western Ontario and Manitoba.
- WILKIE, R. J., and W. J. BRECKENRIDGE. Naturalists on the Back River (*The Beaver*, Outfit 285, spring, 1955, 42-5; and Outfit 286, summer, 1955, 9-13). In this interesting account of biological work on the Back River are included a few observations on Eskimo hunting practices.
- WILKINSON, D. *Land of the Long Day*. Toronto: Clarke, Irwin and Co. Ltd., 1955. P. 261. The experiences of a white man who lived for slightly over a year with Idlouluk, an Eskimo from northern Baffin Island. It contains an accurate and detailed description of the problems of day to day living as experienced by the Eskimo, as well as of the psychological difficulties encountered by a white man in participating in native life.
- WILLIAMSON, ROBERT G. Slave Indian Legends (*Anthropologica*, I, 1955, 119-43). A series of legends collected at Fort Simpson comprise incidents in the creation myth of the Slave Indians.
- WITTHOFT, JOHN. Further Walam Olum Research (*Journal of American Folklore*, LXVIII (267), Jan.-March, 1955, 89-90). This is a brief note on a linguistic study of Delaware, through the medium of the Walam Olum text, being carried out by C. F. Voegelin and John Witthoft.
- WOLFENDEN, MADGE, and J. H. HAMILTON. The Sitka Affair (*The Beaver*, 286, winter, 1955-6, 3-7). Documents from the files of the Admiralty in London throw new light on relations between whites and Indians in Alaska in 1879, conditions which led to the dispatch of a British vessel from Esquimalt to protect the American settlers.
- WRIGHT, JOANNA R. Indian Affairs in British Columbia (*Canadian Welfare*, XXX (8), March, 1955, 13-16). The present-day British Columbia Indians are taking an increasing part in social and educational activities in company with their white neighbours. Aided by government action, it seems probable that they will soon be completely integrated into modern life.
- Yearbook of Anthropology—1955*. New York: Wenner-Gren Foundation for Anthropological Research. 1955. 836 pages. In addition to citing specific articles from this Year Book on *New World Culture History*, *Archæological Theories*, *Chronology and Dating Processes*, and *Anthropology in Government: United States*, the volume as a whole warrants inclusion in any bibliography of Canadian anthropology. The articles, each written by a specialist, deal with significant work of the last few years in all branches of anthropology. Several of the fields are particularly pertinent to Canada, including the relationship of anthropology to *Business and Industry*, to *Primitive Art*, and to *Education*.



EDMOND CLOUTIER, C.M.G., O.A., D.S.P.  
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